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The World's Earliest Music.

APOLLO WITH HIS LYRE. (described page 323.

From a marble relief by Praxiteles in the Museum at Athens.

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"The eye is blind when the mind does not see."—*Arab Proverb.*

THE WORLD'S EARLIEST MUSIC:

TRACED TO ITS BEGINNINGS IN ANCIENT LANDS,

BY COLLECTED
EVIDENCE OF RELICS, RECORDS,
HISTORY, AND MUSICAL INSTRUMENTS
FROM GREECE, ETRURIA, EGYPT, CHINA, THROUGH ASSYRIA
AND BABYLONIA, TO THE PRIMITIVE
HOME, THE LAND OF AKKAD
AND SUMER.

BY

HERMANN SMITH.

Author of "*The Making of Sound in the Organ*," "*Instruments of the Orchestra from Old to New*," "*Modern Organ Tuning*," etc.

Sixty-five Illustrations.

LONDON:

WILLIAM REEVES, 83, CHARING CROSS ROAD, W.C.

Preparing for Publication.

THE

MAKING OF SOUND IN THE ORGAN.

An Analysis of the work of the Air in the Speaking Organ Pipe of the various constant types, with an Exposition of the Laws of Time-distance and of the Tone of the Air, etc., etc.,

THE THEORY OF THE AIR-REED ELUCIDATED.

ALSO

INSTRUMENTS OF THE ORCHESTRA,

THEIR ORIGIN, HISTORICAL DEVELOPMENT AND COMPARATIVE ACOUSTICS, ETC.

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FOREWORD.

A music-trail through many lands, over regions where dwelt the peoples of the earliest civilizations, this I have followed, attracted oftentimes to rambles by the way, gathering evidence on all sides in the course of my journey, picking up whatever seemed to be capable of throwing light upon the early conditions of music; from rock carvings, wall paintings, tablets and vases, marbles and sculpture, papyri and parchments, and records, the treasure-trove and finds of explorers old and new, who seem to have accounted for at least ten thousand years of human experience; —yet withal very few musical instruments of the earlier ages have been recovered, and these for the most part imperfect and unplayable, and we have to depend chiefly upon the ancient representations, drawings or carvings for what we know. Archæologists and antiquarians, unhappily for our quest, have not been very particular in truthfully copying even the drawings and sculptures, often leaving out important details, or supplying some imaginatively; in the absence of

insight into the constructive principles of instruments, indifference may be a natural consequence, and that there was anything at all in a musical instrument worth thinking about, might probably never occur to their minds.

Music is not an isolated fact, it is bound up with the lives, with the daily routine of peoples and nations; its courses of development, cannot rightly be judged apart from geography, ethnography, archæology and history. In the early migrations man's music went with him as his language went, his simple instruments he could fashion by the wayside, and in later eras as men advanced, a craft would organize itself, determining the progress of the instruments from a rude to a refined style of construction; thus a kind of Art would be confirmed and thereout a system of music would arise, which to the people of the time, at whatever stage of attainment considered, would be as mature to them as our present system is to us.

The structure of the instruments defines the possibilities of the music, and my belief is that a true idea of the character of ancient musical display can only be arrived at through a practical knowledge of such structure, its capabilities, its limitations, and the scope of its technique, since the qualities of tone that are at the command of the player are always determined by the means of excitation of the sounds, and by the shape and interior forms of the instruments.

The ancients had no system of harmony, yet there

must have been harmony in the air, a promiscuous harmony arising through the variations in a multitude of unisonous effects.

A study of the Double Flutes, the Greek *Auloi*, has led me to some original conclusions which may or may not be corroborated by future discoveries, and I read with eager hopes of a projected International scheme for the complete excavation of the buried city of Herculanæum, just announced, which, if carried out, may reveal many thing that we want to know concerning these mysterious instruments.

Throughout a long life I have been occupied with books and with music, especially with the instruments that make the music, their construction and scientific bearings and relations, practically and experimentally, and thus it has happened that many advantages seldom combined have favoured the pursuit of the investigations discursively related in the present volume.

My thanks are due to Messrs. Cassell and Co., who kindly supplied several blocks, illustrating the Egyptian and Assyrian sections, used by them in Nauman's "History of Music," and Dr. J. Stainer's "Music of the Bible."

To the Secretary of the Hellenic Society, Mr. J. Penoyre Baker, I am indebted for the photograph of the Apollo of Praxiteles brought by him from Athens, which I use for the frontispiece.

I was agreeably surprised to find that the late Dr. A. S. Murray, Keeper of the Greek and Roman

Departments of the British Museum, in his last lectures on Sculpture, delivered by him at Burlington House, but a few weeks before his lamented death, had selected this Praxitelean Monument for the subject of his discourses. Referring to the Apollo Harp he said "it is quite beautiful." The coincidence of choice attracted me, and calling to mind the learned Keeper's courteous manner, and kindly help in former years, I had planned another interview, with questions which he from his stores of knowledge would have satisfied—but it was too late—he had passed through The Open Gateway.

Intimations of a proposed sequel to this work will be found in the last two pages of the volume, new and valuable materials having been brought to hand by recent discoveries.

Goethe in his "conversations with Eckermann" said that a book should be judged, first, by the aim the author proposed to himself—next, by the degree in which he had succeeded in accomplishing his aim. I may not have remembered the exact words, "'tis sixty years since" I read them, but the purport of the saying is there. My aim in writing has been to give the lover of music a companionable book, full of information of a kind likely as I think to be of interest to both amateur and professional. My own enthusiasm on the subject has, I hope, been tempered by ease in presentation, for I am wishful that the hours given to the reading of these pages may leave with all readers a pleasant memory.

HERMANN SMITH.

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"The true nature of a thing is whatsoever it becomes when the process of its development is complete."

ARISTOTLE.

THE WORLD'S EARLIEST MUSIC.

CHAPTER I.

At the Gates of the Past.

THE human interest in the past never dies, its hold upon us increases with the growing years, and every gain that is made to the store of knowledge does but add to the zest with which we search for more ; nation vies with nation for the glory of recovering relics of life that are strewn along the path of death.

From the sands and from the tombs, from the paintings and the graven tablets, and from the faces of the rocks we rehabilitate the vision of the mighty dead ; a recovered name is a page of a people's history, and we seek with renewal of eagerness for the pages that should follow or precede.

The long buried spoils of temples and palaces excite the imagination, the grandeur of gold and silver, the wealth of art and ornament, and the resplendent jewels, appeal to the love of power and of possession, active

or dormant in every heart; yet not less do we treasure the fragile mementoes, the simplest things, rendered up from the past that were the surroundings of domestic life, that speak to us of the household ways, and of the personal pursuits of the men, and of the adornment of the women who for untold ages have ever sought

"their pleasure in their power to charm."

The instruments of music that in the remoter ages of the past were in daily use are seldom found, for the nature of the materials of which they were constructed was adverse to their preservation; those that have been found are rarely in their original condition, perfect in all their parts, or suitable for being put to the test of playing, and the resource left to us is to obtain some approximate condition by means of models, and then adapt some modern method for eliciting sound, which method as near as we can judge shall be the counterpart of the original device.

My conviction is that to understand the old music the first necessity is to question the old instruments, that they will best indicate and tell most clearly what the music must have been.

Those "findings" then, the treasure trove of explorers, have great attraction for me, as they have for many other musically-minded people. The archæologist, it is true, is in no degree concerned with their musical import, he is content with their presence as antiquities; paintings and sculpture interest him in many ways as examples of art, and consequently the musical investigator gains by researches which yield him pictures of musical instruments in the using, and representations often in marble and bronze; yet withal I do not imagine that the enlightenment of the musi-

cian has been one of the motives influencing the archæologist in his care for the preservation of the treasures recovered from the past. Thus it happens that in published illustrations the details, upon which so much of the teachable value depends, are too often inaccurately carried out, or perhaps it may be are fancifully perfected to accord with some preconceived idea, and thus the student is misled. In museums likewise, there is no little difficulty in obtaining accurate information respecting objects exhibited, and details which are of the first importance, are obscured by some awkwardness in the placing of the objects. The reason for these unintentional hindrances is simple enough: we have but to remember that the antiquarian is not bound to understand the nature of musical instruments, and as a matter of fact he does not understand them.

The two chief lands that hold the music of the past are Egypt and China; yet in how different a manner is the holding of each. Which nation is the ancientist none can tell. East is East, and West is West. From some early birthplace the two people diverged. The people of Egypt have vanished; the people of China remain; they are one fifth of the existing human race. Both people intellectual; yet the brain development of the Chinese has had from its original birth-strain a distinct causation, making its course parallel to that of no other brain. A sport of nature? ask Darwin or the Dragon!

In Egypt we dig and delve and year by year recover the treasures that she holds. In China there is nothing to recover, nothing to dig for, all her past is huddled on

the surface. Her music and her musical instruments of the past are here to-day, the same as they ever were, there are no stages of development and no steps of ascent.

Thus the treatment of the question of the earliest music of China is distinct from that of others, and the knowledge of the method of its foundation is to be gathered from the musical instruments still in use.

Chaldæan history extends back to a very remote antiquity. Mr. St. Chad Boscawen, a high authority, states that the working of metal had been practised as early as 3,000 B.C. in Chaldæa, that there are inscriptions certainly as ancient as 4,000 to 5,000 years B.C., and that one of the earliest Chaldæan sculptures contained a representation of the harp and the pipes which were attributed to Jubal. So that we have to go back very far indeed up the stream of time to find the beginnings of music.

That system of music which is the heritage of all the European races comes from the people called the Greeks, but the art as practically pursued by them was lost, or was hidden by an impenetrable cloud.

Lacroix, in his history of "The Arts of the Middle Ages," describes the condition of the early centuries of our era—one brief passage tells the tale. He says, "Ancient Rome, which had no natural music, readily adapted Greek music, in the time of the emperors, to all the usages of public and private, as of civil and religious, life. Art remained Grecian, and most of the singers and players came from Greece to take service under the wealthy patricians. The various forms of Latin prosody were but thinly disguised beneath a veil of Ionic, Doric, and Lydian melodies, even when the Christians waged a relentless war upon profane music,

not only as an accompaniment to the rites of the pagan religion, but as played in the circus and other popular resorts to excite the brutal passions of the multitude, or at the nocturnal orgies of the aristocracy. The decadence and the disappearance of Greek music in Italy and the West date from the reign of Theodosius; and when the games of the Capitol were put down, about the year 384, the Greek musicians either returned to the East or abandoned their art."

The light of Greece suddenly went out, and darkness surrounds all that relates to the actual characteristics of their musical instruments and their music, notwithstanding the preservation of learned treatises and the citation of numerous historical references. Musicians grope in the dark still, and are unable to realize the musical art of the Greeks. The lyre and the kythara and the flute are before us in numberless painted designs, are sculptured in enduring marble,—yet they fail to raise in our minds any adequate idea of the influence of their music upon the national life. The past has closed the gates of the past, and the land beyond awaits the explorer.

Pursuing this line of thought, and taking Greece as the grand junction whence radiate all the lines of musical art up to the present day throughout Europe, we find the pathways that have converged to Greece may be arranged this wise in diagram:

WESTERN PERSIA.

CHALDÆA. INDIA.

ASSYRIA. CHINA.

ARABIA. LYDIA.

EGYPT. ETRURIA.

GREECE.

These are the pathways of music, through which Greece derived her knowledge by direct or indirect transmission. On the one hand we can distinctly trace the line back to Chaldæa by way of Egypt; and on the other hand back to Persia, where indeed the origin of the race itself can be looked for. Not in any formal method do I wish this diagram to be understood, for there may have been—and I should infer were—crossings of influence, as between Chaldæa and Arabia, Egypt and India, China and Persia, and so forth. Perhaps another plan of diagram would be by placing Persia central as the source of early tribal dispersion, with sign post pointing in the different directions to Arabia, Chaldæa, India, China. Lydia includes the Asiatic coasts of the Mediterranean. It appears to me that the Chinese influence upon the Greeks was direct by commerce overland; and that in reference to time there was a primitive branching off of the two races from some Persian region.

The ethnological question is too deep for us to judge of, and we can only take the guidance of those who are at this day the recognized authorities. Mr. St. Chad Boscawen traces the Babylonian, the Egyptian, and the Chinese civilizations to the mountainous regions of Western Persia. It will be shown in the chapters on Etruscan lore how Greece derived from Egypt through Etruria before she was in direct constant intercourse with that land, and then subsequently developed her most enduring records of musical art in the hands of the Etruscans. As to China, there may seem at first some difficulty in recognition of influence; but at all events silk from China had penetrated to the Mediterranean before the Greeks knew how it was produced in

"far Cathay"; and in the motley gatherings of all peoples and tongues on the coasts of the blue sea, doubtless the representative of the yellow race one day found his way. The Greeks were great travellers; and who can tell where the barrier was fixed that ordered them to turn back.

Persia has left no musical relics, and Mr. A. J. Ellis states: "Of the ancient Persian scale we know nothing, but it was most probably the progenitor of the older Greek."

The Greeks undoubtedly had an elaborate system of music; but there was no evidence of its practical application to the extent that would have been supposed. Indeed, Pythagoras states that "the intervals in music are rather to be judged intellectually, through numbers, than sensibly through the ear." The view taken of music by the scholars was demonstrative, and purely on the ground of mathematics. It was altogether apart from popular practice of the art, vocal and instrumental. The philosophers regarded music from the side of morals. In the same way, the Chinese had attained a high degree of knowledge of music in its demonstrable relations, upon which they in their learned treatises eloquently discourse. In demonstrations of the laws of pipes, and in theoretical development of the system of equal temperament, they have displayed their mental grasp; but beyond that the acquired knowledge seems to have made little practical impression. Their philosophers likewise talked of the beneficial influences of music in controlling the passions, and doing other "et cetera" work.

My long tarrying with the musical instruments of Celestials has tended to bring very forcibly before me

the great resemblance between the Chinese and the Greek systems of music. Wide asunder as these people are racially, yet in their development of the musical art they seem to have some close kinship, some common source of idea; and little traits of primitive lore constantly give suggestions of some early centre whence the two have diverged, or of some point where in the crossing of the pathways they have supplied themselves from the same fountain, although each traversed in a different direction its appointed course.

The possibilities, however, that I have in mind are of some far earlier impressions from intercourse, how and when constituting the problem; for the Greeks in their prime were but the infants of a day in comparison with the peoples under the great monarchies of Chaldæa, Assyria, Egypt, and China, whose rulers could be traced back two, three, four—aye five—thousand years before the first block was hewn for the foundation of the Parthenon, or ever a Venus stept in marble.

Van Aalst states that "the first invaders of China were a band of immigrants fighting their way among the aborigines, and supposed to have come from the south of the Caspian Sea" and the question remains, where was the earlier track of their wanderings? Is it not also curious that one of the early mythical Kings of ancient Persia had the name Houscheng? It was in his reign that the Persians became Fire Worshippers, adoring flame as the symbol of God.

Yet it is by way of Chaldæa and Egypt that our chief interests will be found, where relics of the musical arts had permanence not granted to them elsewhere. Persia and India yield us less as matter for enquiry, since it is the class of stringed instruments of light kind

that their peoples have mostly favoured. Some problems are still left in India which we should like to have solved. The transverse flute is constantly found in ancient carvings in the hands of Krishna, who is popularly believed to have been its inventor ; but how it came about that the double flutes should be found on the carvings both of wood and stone awakens curiosity. What historical significance had they ? Not a survival of any kind is there in the usage of the present time. Only as it were yesterday, at the British Museum, I was looking over the series of very old carvings in wood, —friezes which have formed the risers of the steps to the Tope at Jumal-Garlic in Afghanistan, crowded with figures of men and women and animals in the uncouth style so characteristic of the land that was the home of Buddha. In these scenes, depicting the history of the great Renunciator, I found amongst the groups of players on instruments several instances of players upon these double pipes, the counterpart of those graven in the historical records of Babylon and Nineveh, and painted on vases by Etruscans, and carved in marble by the Greeks. What does it all mean ? How have the races of mankind been affiliated ? We find the double flutes in India ; we do not find them in China. In that intermediate land of Thibet, has the Grand Lama any evidence or record of them ? It is curious that the Chinese, although they have the earlier Pan's pipes, have neither the double pipes nor the lyre—instruments of Greece—yet they have a system of music essentially the same as the Greeks, and (as will be shown you in the *Sheng*) a scale consisting of the two conjunct tetrachords, forming with an added tetrachord an octave and a fourth ; the key-note being the fourth

of the scale, equal to the *Mese* of the Greeks. The Chinese style of music though lacking the refined ideal of art is on precisely the same lines, vocal with recitative and instrumental interposed phrases; and if the hymns of the old Confucian temple be transcribed side by side with the fragments we have of the worship of Apollo only exacting criticism could determine the different origin. They are equally capable of being harmonized with effective dignity. Further, I would remark also that the Chinese notation, like the Greek, consists solely of added signs written beside the words of the hymn. All the details seem to point to a time in a far distant past when both races were in contact with one source; then came a day of sudden disruption —one race eastward, one race westward: each pursuing its own way. So the years rolled on, bearing their records on two distinct rolls of separate destiny.

The twofold destruction of the vast library of Alexandria by fire, the first time by accident the second time by fanaticism, has been an irreparable loss to music, for there, if anywhere, would have been treasured those records of the learned men of old, which would have told us so much that we want to know.

Now, beyond the paintings and the sculptures, all the knowledge that remains comes to us through the literature of the Greeks, the sole inheritors.

The descent of Music is in direct line from Egypt; and Egypt would in like manner have derived from some earlier civilisation the first elements of her own. There are words in an inscription in the Temple of Dayr-el-Bahari which I think may be taken as shewing Queen Hatasu's traditional associations of thought in

reference to the origin of her race. This famous Queen built that magnificent Temple, and dedicated it in part to Amen the God of Thebes, and in part to Hathor the Beautiful, the Lady of the Western Mountain, the Goddess-Regent of the Land of Punt. Hatasu is represented as suckled by the goddess, who is also the nurse of Horus. In this temple there is a wonderful series of bas-reliefs sculptured and painted on the walls, a panorama in stone of

> "The five large ships she built in obedience to the will of Amen, King of the Gods, that they should traverse the Great Sea on the Good Way to the Land of the Gods."

The stone pictures shew these vessels at their departure and return, with variety of details of loading and cargo, etc. On the mast of one of the ships a three string lyre or bow-harp is slung. In the description of one of these vivid pictures, are these words, written as the Queen Hatasu ordered, and probably taken from her own lips as what she wished to be set forth

> "We sailed on the Sea, and began a fair voyage towards the Divine Land, that is to the coast of Arabia, and the journey to the Land of Punt was happily resumed."

The vessels went from the Nile by an ancient waterway, partly canal, into the Red Sea, and it would seem that we are to understand (for much of the whole inscription has broken away) that for some special cause they were diverted and went first across the sea to the coast of Arabia, a proceeding doubtless of some temerity, but that *happily* they escaped danger, and went on to their original destination, and brought thence the

myrrh and the actual trees of *Ana*-sycamore, the coveted oderiferous trees, the chief object of the voyage being to secure the costly incense for the service of the white Temple built by the Queen. It seems to me that Queen Hatasu's words "the Divine Land" point to her belief that there in Arabia, and beyond, to that far eastern horizon where the white mountains meet the blue heavens, there, was the true home of the Gods, the earlier home whence came her race. Maybe she cherished the names of Anu and Ishtar, and knew that these old deities of Chaldæa were those she worshipped under Egyptian names.

The common course of newer nations is thus, to take and to rename the old gods. Herodotus considers that the names of nearly all the gods of Greece are derived from Egypt. To each of the ancient nations it would seem that the old solar myth was newly told in parable, the esoteric meaning of it known only to their priests.

That wonderful piece of wall sculpture may be seen to-day; time and the tourist have destroyed some portions, yet enough endures to tell the story which the great Queen left there three thousand four hundred years ago. Just as it was in the old Chaldæan temples, the sanctuary, "the Holy of Holies," is cut in the rock itself, far within, there light was not needed, "for the gods see everywhere." This beautiful white temple rises in three terraces cut out of the limestone cliff, and once had an avenue of sphinxes three miles long, leading down to the blue river.

Looking at the plan of the Temple one sees that the thought of it was Chaldæan, it is so like the terrace temple of the God Bel by the Euphrates, and I cannot but think that the three-string lyre hung on the mast of

the ship she sent to "the coast of Arabia" had a meaning to her own heart, was a simple token that would be understood by all of her royal race, to show by this symbol that the lyre originally came from that "divine land" whither her thoughts went, as a child turns to its mother.

The Early three stringed Lyre of the Egyptians.

Fig. 1. The same Lyre as pictured slung on the mast of Queen Hatasu's ship.

CHAPTER II.

In the Land of Myth.

THE PURSUIT OF THE GODS.

IN the land of Myth there occur many landmarks that project their shadows into dim distances, telling with no uncertain indications that the land of Fact is a much more extensive region, that it environs both the land of myth and the land of tradition that borders it, and yields to the explorer many evidences much earlier in racial history, when as yet the mind of man had not imagined

"the fair humanities of old religion."

In the pursuit of the gods we have to look back far beyond the age whence the gods emerged. Like the rivers that come to our feet at full flood so are these very human gods, they represent men in the fulness of power, and disclose not the long course, the broad expanse of time, the toilsome difficulties, through which that power has been attained.

The Greeks attributed to Apollo the invention of the lyre, the eight-stringed lyre a completed and perfect in-

strument of music. In the British Museum there is a magnificent marble statue of Apollo, and in his hand the sculptor has fashioned a lyre of noblest pattern, such as his fellow worshippers believed the god had designed and given to them. We, of later days, well know that so accurate a leap to perfection does not accord with human experience, and moreover are able to trace the stages by which in the course of centuries the lyre had arrived at that complete condition. So by the help of the Greeks themselves, by their literary records, by their representations in sculpture and in paintings, I hope that we shall be able to recognise the process by which men worked in their own day of life from generation to generation for the accomplishment of their aims in the art and pleasure of music.

The great god Pan, beloved of the Greeks, and more widely worshipped to-day under another name, gave men the little river reed to make their music with, and marvellously has the gift flourished ; the simple tiny pipe, growing with the growth of centuries, has become a pipe speaking with the voice of Jove, has reared itself upward until its heighth would make it fit to stand beside the hand of the great Phidian statue of the Olympian god. Simple as a Pan's pipe is the great diapason that reaches upward to the vaulted roofs of our temples. Not more impossible to the mind of the ancient Greek the conception of the thing of music we call an organ, than is to us the realization of the faith in those divinities of mountains, woods, and streams, of those early dwellers in a green world. Yet how we linger over the legends of the past, and almost wish we could believe they once were true. Alas, in our well worn world, fancy is a poor exchange for faith. The

legend of Pan reads how a nymph, Syrinx by name, whom Pan was pursuing, prayed the Naiades (the nymphs of the water) to change her into a bundle of reeds, just as Pan was laying hold of her, who therefore caught the reeds in his hands instead of the desired nymph. The winds moving these reeds to and fro caused mournful but musical sounds, which Pan perceiving he cut them down, and made of them the pipes first known as the Syrinx, and afterwards called by his name,—

"The pipe of Pan to shepherds
Couched in the shadow of Menalian pines
Was passing sweet."

Fig. 2. Ancient Greek players on Flute and Pan's pipes.

The Pan's pipes as a musical instrument made its mark in history ; in almost every land in some form or other it has existed as a popular instrument, and therefore a source of pleasure. Varied in form, and with pipes few or many, it is found on ancient sculptures and in paintings. Europe, Asia, Africa, and America show specimens of the instrument ancient, and often modern ; for the use survives among some people not yet spoilt

by premature civilization. The British Museum possesses a very peculiar specimen made of stone, which was found in Central America. Another, of which there is a cast in the Berlin Museum, was discovered placed over a corpse in a Peruvian tomb ; it was made of a greenish stone, a kind of talc, and had eight pipes which gave their notes as in ancient days.

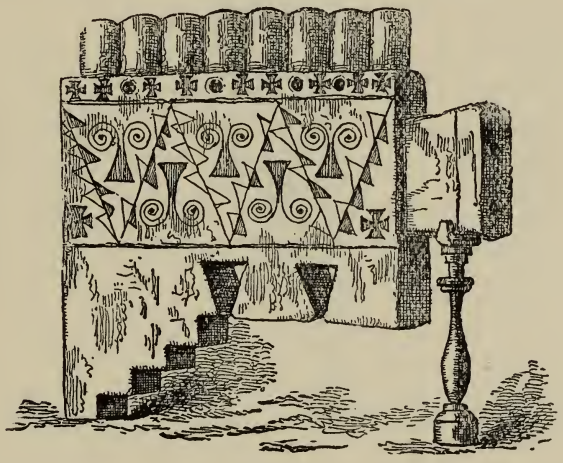


Fig. 3. Ancient Peruvian Stone Syrinx.

The British Museum possesses an interesting relic from a tomb at Arica ; this Peruvian *huaraya puhuna* consists of fourteen reed pipes of a brownish colour tied together in two rows, so as to form a double set of seven reeds ; both sets are of the same dimensions and are placed side by side, one set being open at the bottom, and the other set being closed, consequently capable of producing octaves to the open set ; a remarkable feature therefore is the presence of the open set, indicating a clear perception of the musical relations of the two distinct forms used.

The Chinese also have their example in the instrument they call "The Outspread Phœnix" or the sacred bird,

to them the outward symbol of some myth that had credence from immemorial times.

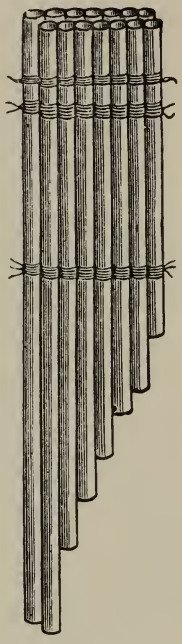


Fig. 4. Peruvian Pan's Pipes, Double Set.

From a Tomb in Arica.

Whether there has been a migration of races and heritage of primitive invention, or whether with each people the Pan's pipes had spontaneously originated, is a problem upon which curiosity cannot fail to be awakened when it is noticed how these instruments, almost identical in make and shape, are found all over the world (*see forward "In the Land of China."*)

The Chinese instrument is an assemblage of pipes of various lengths from which musical tones of different pitches are produced,—it is a mouth organ. Our modern organ is likewise an assemblage of pipes, and differs only from it in respect of number and degree. Perhaps the blowing across the open end of a pipes was the earliest mechanical way of producing a flute sound. The little

river reed pipe of Pan is therefore selected as the type of all flutes; the principle is the same whatever the variation in method of sounding.

Yet the appearance of Pan marks only one stage in the land of myth, and that only just within the confines near where the border lines of myth and history meet. For many thousand years beyond this the imagination must travel to reach the earliest sources of music. The complete set of seven pipes claimed by Pan was not the work of a summer's day, the scale as seven sounds was not the witchery of a nymph's voice happily remembered by a forest God; no, we may be sure the course of life was more prosaic than that, and the seven-toned instrument had, as a seven branched river, its beginning from one,—one pipe, ages, it may be, earlier than the seven.

What do I make of it? Clearly this,—man is a measuring animal. Like other animals he calculates, forecasts and provides, but he alone possesses the measuring faculty. Rambling again and again through the region of the past, the thought presses forward for recognition that man is a measuring animal, and hence his ability to produce instruments of music. In the beginning they were all founded upon measure, the rude measure of what suited the fingers; and the habit of so marking off spaces, as time went on, recorded itself in a system, at first simple as a child's wit could compass, and afterwards so growing in complexity as to tax the ingenuity of the most active brains of full-grown civilized men to master and utilize, and yet at the last nothing more than a system of finger activity for the covering of holes and the touching of strings. Thus your musical scales arose. Had Polyphemus had the

ordering of a musical scale, most surely the intervals would have been considerably larger ; he would have suited his own fingers whether with lengths of strings or with holes in pipes.

Imagine yourself a prehistoric man. How would you set about whistling ? The lips are in the control of the imitative faculty ; the effect called whistling would naturally be first elicited by accident of emotion, or sensibility of one kind or other. The intent to whistle would arise in desire to imitate ; a chance whistle heard from a shell or hollow nut or reed would attract attention as for imitation. To imitate, is, as we know, a propensity of monkeydom. How the human animal shares this propensity as a characteristic of his race, and how society is based most differentially upon it,— is not that also taught and recognized in philosophy ?

Beyond the faculty of imitation man possesses that of measuring ; he measures and apportions in his buildings and his bakings : inches and acres bear relation to each other ; he marks off spans and cubits and inches, and apportions minutely by millet-seeds and barley-corns. For in earliest times simplest means and methods were as arbitrary as are now our elaborated mechanisms. It is a truism that music is ruled by measure, but what I want you to perceive is quite a different interpretation, and that is that it was the *measuring that ordered the music.*

Those who, seeing the holes that are cut upon a common flute, or oboe, consider that in the origin of the instrument they were so done in order fitly to comport with a musical scale, are wrong in their supposition.

In the primitive making of a flute the holes were cut

to suit the spread of the fingers, and the scales which followed as the result of the placing the holes, were accepted by primitive man; the ear got to like the sequence of sounds, and it so worked into the brain of the race, that ages after, it became an intellectually accepted musical scale, or relation of notes and was varied by evolution; the structure of the organ of hearing is the same in every race, so far as we can ascertain, and the same natural laws are obeyed in its exercise. Different races, however, have developed the hearing ear differently as to its choice, because primitively, in the setting out of their instruments there were differences of relation. The lengths of the strings, and the distances of the holes spaced for the *convenience of the fingers*, ordained the musical scales. Contrast the music of the European and the Asiatic races. Our so-called divine music is to the Chinese miserable, unscientific stuff; and the sounds which please Asiatics as entrancing music, are to us distracting din, positively painful to listen to. The liking of the ear in music is a liking by inheritance, transmitted as a facial type is.

The fingers are the fates of the musical art. Curiously enough, six fingers have been the chief arbiters of the nature of man's music; and yet how long it was before that number was brought into use. Earliest pipe instruments seem to have employed only two fingers; then the thumb was made available, after that the third finger, and at last the little finger was brought into service; it was, however, the period of the ruling of the six fingers, three of each hand, in which the scales were laid, and the art of music developed. In the stringed instruments there is evidence of similar advance from one string to many. Men learnt slowly

the marvellous capacities of the lissome fingers they possess.

We should see a meaning and a purpose in each change and variation in the shape and adaptation of instruments. It may strike you somewhat strangely that you should be set thinking of bits of wood, and pipes and strings, as being aforetime the actual music makers, moulding in fixed forms our musical tendencies. You fancy they are our servants, unaware that they have ruled us earlier than we have ruled them.

My conclusion, curious as it may seem, is put forth seriously, after much study and after long inquisitive looking into things, possibly worth thinking about. Very lately I found a pertinent yet undesigned confirmation of my views in a work by Dr. A. J. Ellis on the "Musical Scales of Various Nations." As a result of his extensive investigation, he says "The final conclusion is, that the musical scale is not one, not 'natural,' nor even founded necessarily on the laws of the constitution of musical sound, but very diverse, very artificial, very captious." He has actually, as it were, caught the scale in the act of changing by a caprice at the bidding of the finger. On the lute, in the very early Persian and Arabic scales, the middle finger had nothing to do, and to find employment for the lazy finger, a ligature was, on the neck of the lute, tied half way between two existing notes. One Zalzal, a celebrated lutist, who died eleven centuries B.C., tied this ligature half way, and so added two notes to the scale. "These notes," Dr. Ellis says, "became of great importance in Arab music, and effectually distinguished the older Arabic form from the later Greek."

For the coherence of the views I express upon this

question, it is to be implied that pipes and reeds have had an earlier development at the hands of man than strings had, although the latter furnished the first tangible means by which musical ratios were demonstrated by Greek philosophers. In China the first standards of sounds were pipes, and by them the degrees of the scale were fixed historically, yet too complete to have had their real origin elsewhere than in the land of Myth. There also must be placed the origin of the beautiful little "Sheng" to which the Chinese attribute an unknown antiquity.

The term flutes, it is necessary to remember, is in ancient usage of literature applied to include all pipes blown across and likewise those sounded by means of reeds that the breath sets vibrating.

All the world over men have found delight in fluting, and the flute as an instrument appears to be the common property of the human race. Either of bones of animals or birds, of reeds or alders, of stones or of clay, the art of man has fashioned flutes from the beginning of time's records.

Seeking to trace man's earliest musical instruments it will become plain to us that life moves very slowly. How little is really new; variation follows variation. See what a long process thought is. It takes a whole race many centuries to think a new thought, and embody it.

The Greeks as themselves acknowledged were indebted to the Egyptians for their chief instruments. The invention of the flute is attributed to the god Osiris, who lived when the world was young—ages ago; Osiris, the dead god of the blue river, the ancestor of history, the river known to all our race as oldest of

rivers. When our thoughts dwell upon "old Nile," how memory-haunting are the lines in which Leigh Hunt describes it;—read softly,

> It flows through old hushed Egypt and its sands
> Like some grave thought threading a mighty dream.

CHAPTER III.

In the Land of Egypt.

THE LADY MAKET AND HER FLUTES.

The Lady Maket took possession of her latest residence with the appropriate ceremonials befitting a lady of her position; and as she had contemplated frequent excursions from her place of abode, much attention was given to provide her with suitable travelling attire, and also with numerous things requisite for her use; and, in addition, certain personal belongings considered necessary to her comfort—articles of the toilet and other customary aids to the anxieties of woman's mind—all such were collected by her attendants. Nor did they forget to gather together good supplies of fresh fruit, for there was no knowing the lady's ultimate destination, except that she would undoubtedly be ferried over the great blue river; and indeed some of the officials, who assumed to have intimate knowledge of their lady's engagements, gave assurance that she would visit places at very great distances, even so far as the under side of the world. Since the early morning

every hour had been filled with the noise of a busy turmoil, and the eager interest of the people only gradually lulled as time went by and there were signs that no further labour was needed on the part of any ; every work had been performed, the duties of each had been fulfilled, and then gradually the officials and attendants retired from the presence of the mistress of the house. The lady was at last left in quietness. The long day was suddenly over,—the sun went down,—and the night had come, and the great silence.

Like all others of her race, the Lady Maket was a fourfold personage. All her notions of herself were of a tetrachordal state of being. Her gold seal impressed with her name testified to all men that she was a being of flesh and blood—really and truly human—and not at all a mystery, unless to be feminine is so ; and that she greatly loved her burnished metal mirror, and delighted in the dark glory of her hair, in the coral of her lips, in the flashing light of her eyes, and in the deftness and musical skill of her almond tipped fingers—all that is past question. She believed that, besides the bodily state of her presence, she was possessed of another equally living, although invisible form, a *double* called *Ka*, which was as it were a less solid duplicate of her corporeal being ; and after the *double* came the *Soul* (*Bi* or *Ba*), and after the soul came the *Khoo* or the *luminous*, a spark from the fire divine. To keep the four fold-unity of being, to preserve it wholly pure and unblemished, and to secure it against the possibility of separation or dissolution, was to her the most anxious consideration of her life ; and this belief gave the essential reason for the assumption that the number four

was of all numbers the most sacred, and the idea thereof was ingrained into the daily life of all her people.

Paying a visit to another mansion, I made enquiries for Lady Maket, being much interested in her and her doings; but Mr. F. Petrie, who then in charge, informed me that it is some three thousand years since she was seen, and although I could not see the lady, yet he had many of her belongings which told all that was known of her. I saw the chair—the last, it was believed—upon which she sat, and the wooden head-rest (the substitute for a pillow) by which her dark luxuriant ringlets were preserved from becoming crushed or disordered. I saw the silver scarab rings she wore, the earings and bead necklaces, the combs and perfume holders, the paint and pomade jars, and the bronze mirror in which she last looked, confessing her delight in her own beauty.

Here also were the flutes, the two slender flutes, that plaintively wailed their music and accompanied her to her last home. Flutes! The very word has magic in it. Egyptian double flutes, and thirty centuries passed them by, and they are here. Adonais,—what a find!

For forty years in this wilderness had I been looking for them. Pictures of them by the score I had sought out, had seen them on walls and vases, graven on brass tablets, gems and marbles: yet none seen in real presence. Now in sober earnest they were laid before my eyes, given into my hands, perfect as when they were entombed to accompany that blessed lady to the nether world. Perfect did I say? Yes, but not complete. How fateful fortune does tantalize us,—clears up for us one mystery, and leaves another behind. They forgot the reed tongues in packing up for the journey, or perchance they deliberately withheld them. Ah! miserable

that I am. Mr. Petrie tells me that he could find none, and he sifted all the dust of that dear lady, and nobody he avers had been there before him,—not for three thousand years. Think of it! A rock hewn sepulchre, in eternal night and silence since the days when Miriam sang her song of youth and triumph.

Moreover, to my questionings, Mr. Petrie says that he does not believe that these flutes ever had any reeds to play them, but that they were blown at the end, and so whistled as one whistles a key. Then, to crown me with confusion, up rises another archæological investigator with eyes deeply scrutinizing, and he is certain that they were true lip blown flutes, and that no reed was ever employed. I looked with other eyes, and one glance told me that these pipes originally had reed tongues, reeds of the immemorial kind, and in use to the present day in the arghool. No, by Adonais, surely I cannot be deceived in this. Surely these are the *Gingroi*, the wailing flutes, associated with funeral ceremonies, slender pipes scarcely bigger than a ripened corn stalk. A fragment of such an one exists in the British Museum, which often excited my curiosity, but was in so delapidated a condition that nothing certain could be made of it. The discovery of this pair of flutes however made clear the relation though the British Museum possesses but a fragment, and treasures it.

Curious is it not? A nation takes into its care a broken straw, because some human hand in the dim past has fashioned it to use and purpose, and the subtlety of life has not gone out of it yet.

Very precious are these recovered flutes. They tell us of a people's music, definitely fixed and in use, theirs by choice, by tradition, by religion. They

owe their preservation to having been placed within a larger reed, which was doubtless their ordinary case. They were found untouched since that last day. Not from mere sentiment were these flutes placed beside the Egyptian lady in her tomb, but because of a deeply rooted religious belief that these, together with the other articles named, were in some way connected with the daily existence and the comfort and content of the *Ka*, the *double* or dream body, which perpetually inhabited the tomb with the embalmed mummy. In point of fact, it was the *double* of the flutes that was to prove a source of musical solace, not the flutes themselves, for they would not be touched by the dream body. The Egyptians worked out their views with logical consistency, and believed that all things had their *doubles*, both animate and inanimate. Even a pictorial representation in default of the real thing was of almost equal value for the service to be rendered in the invisible world, and a mere name written had a potency and could secure the coveted benefits to the *Ka*. For the soul or *Bi* was often called upon to follow the gods in the heavens, or to undergo probationary journeys to the world of darkness below the earth, and then the *Ka* was left alone, and occupied itself with the pursuits common to its earthly life. Thus from this strange belief we may presume, or may infer that the Lady Maket was not only a lover of flutes, but might also have held some official position, civil or religious, connected with the use of them.

There is a similar instance in the case of a mummy in the British Museum, where you may see, at the feet of the dead musician, the bronze cymbals he played when alive, with the people dancing around him. Is

the dream body—the *Ka*—still there, I wonder, coming out at night to talk with his fellows? Dream bodies like himself, all terribly old, all listening to the clashing of the ghostly cymbals, and joining in unheard melodies. All terribly old!

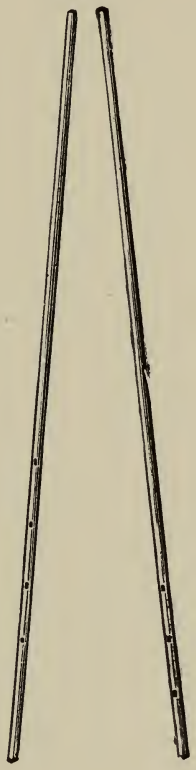
These flutes, so slender that a breath might almost blow them away, are undoubtedly of the type pictured in many lands in many ages, and known as double flutes—double in the sense of being paired. I have seen such, though of fuller proportions, represented on Egyptian *papyri* on walls of tombs and temples of the land of the Nile; and on the brass plates of the palaces of Nineveh and Babylon; carved on the frieze of the Parthenon; painted on Etruscan vases, and on the walls of Pompeii and Herculanæum; and far away on the banks of the Petwa (a tributary of the Ganges), sculptured on the gate of Sanchi Tope. And yet through all these instances never have I found any evidence of the means adapted to produce their sounds; anything that would enable one to form a distinct judgment as to the kind of mouthpiece employed in blowing. The number and the positions of the holes have also been involved in doubt. In some few instances holes are to be found marked, but these might be conventionally depicted, and could not be relied upon as guidance to the scale of notes. Then there are the shams and indications put in by the audacity of restorers, so that altogether the learned or academic knowledge concerning the ancient instruments can hardly be said to have emerged from a state of haziness.

How welcome, then, must be these Egyptian flutes, which at all events furnish sure evidence of the position of the holes, and of a recognized musical scale deter-

mined at a very early date in the development of civilisation. The illustration Fig. 5 gives the relative position of the holes and of the lengths of the flutes, which are shown here one sixth of the actual lengths.

Fig. 5.

The Gingroi, or flutes of wailing.



Found in Lady Maket's Tomb.

All pipes that we call *double flutes* are represented spreading from the mouth Λ shaped, held both of them in the mouth, and played one by the right hand and one by the left. All pipes of the ancients the writers were accustomed to call flutes, not discriminating the differences in types, being in fact unaware of the very important distinctions as in later times perceived by

specialists in musical lore to be necessary between lip-blown instruments and reed-blown.

One of these instruments is 17$\frac{5}{8}$in. in length, and the other 17$\frac{6}{8}$in. ; and the bore may be considered as $\frac{3}{16}$ths of an inch ; but one is a trifle larger than the other, and they are not absolutely cylindrical, being larger at one end than at the other, which is not without significance. Also, it should be noted that being of the nature of corn-stalk, each has a knot 6$\frac{5}{8}$in. from one end, and this knot has been bored through to make each a continuous pipe. There are four holes in one pipe, and three holes in the other ; they are very daintily cut, and are oval. The pipe with four holes is held by the right hand, and the pipe with three holes by the left hand ; for it was the custom in ancient times, and still is in eastern lands, to play the treble notes by means of the fingers of the right hand, and the bass notes with those of the left hand.

When looking at these pipes we should remember that in the day when they were made the feeling for a musical scale was in its infancy ; natural science, young indeed, then, had not touched the question of the relation of sounds. In that remote past, the barbaric had its sway, as in the east for the most part it has now ; and no idea of harmony, other than that of a consensus of instruments, and a congregation of singers following on traditional methods handed down from generation to generation. Thirty centuries have passed since the calm day when the workers let down the great stone portcullis sliding in its grooves closing the tomb against all of human race, leaving the Lady Maket and her treasures secure in her burial chamber, closed, as they thought, for ever.

At that day Homer was not born, and it would be six centuries before Pythagorus would arrive on this planet, and, destined thereto, turn his steps to the banks of the Nile.

Mr. Wm. Chappell in his "History of Music" writing in 1874, describes the fragment of a pipe which I have referred to, then all that the museum possessed.

"In the Egyptian collection at the British Museum is a small reed pipe of eight inches and three quarters in length. The pipe corresponds so precisely to the description of the *Gingras* given by Greek writers, as to leave hardly a doubt of its identity. The *Gingras* has four holes for the fingers. Athenæus says it was employed by the Carians in their wailings, and that their pipes were called *Gingroi* by the Phœnicians from the lamentations for Adonis, 'for your Phœnicians call Adonis, *Gingras*, as Democlides tells us.' So this Adonis pipe was admittedly of Asiatic origin, and was most likely common to the various nations of Asia as well as of Egypt."

In the previous chapter I laid emphasis on the conclusion that the fingers were the fates of the musical scale. In these pipes I read the same lesson, and recognize that the scale was due to digital decision. The mystery of numbers pervading the thoughts of the people, and ruling their daily goings, consorted here with convenience of the fingers. The sacred number "four" took the first place, after that the number "three," and—the union of these producing the number "seven"—the thoughts of numbers moved in an enchanted circle, from which the human race has not yet escaped. We call it superstition to believe in lucky threes and sevens; to these old Egyptians, numbers

were a sacred power never to be disregarded. Here, in the four holes of the first pipe we have the primitive tetrachord, planned before the sounds were heard, before the issuing notes had names; and it was this tetrachord that was taken up by the Greeks, and by them moulded into mathematical relations and blended by art into musical form. A similar primitive tetrachord was, I conceive, common to all races of men possessing a musical scale. The second pipe has but three holes; there was room for more,—why restricted to three? Who can tell?

It is as easy to have faith in one mystic number as in another; and when we are inclined to believe in the mystical, nature helps us with the utmost readiness.

In using the word "tetrachord" bear in mind that the meaning is a series of four notes in an order of succession, and not the union of notes as a compound sound or "chord."

Pipes with but two holes are common in pastoral use now, and in early times doubtless preceded those with three and four holes; and, however slow the changes, progress could not be absent. In Lady Maket's pipes we see evidence of a great change, a tetrachord with an added tone, and this supplied by another pipe. Who can tell how many centuries of civilization such progress indicates?

An interesting speculation centres upon the means by which the sounds were produced. Were the pipes lip blown at one end, or reed blown; and, if the latter, by what reed? One of the hautboy kind, or one of the clarionet type such as the arghool? The first is called a double, and the other a single reed. Fig. 6 is an illustration of the arghool reed, full size, as used at this

day in the arghool; it is called a beating reed; the reed tongue is made by cutting a slip at the side and lifting it a little, and, as it is bound by string at one end, the tip tilts, allowing passage for the wind through the aperture that the cutting has left beneath, upon the edges of which it beats in vibrating.

Fig. 6. The Arghool Reed. Full Size.

Fig. 7. The Hautboy Reed. Full Size.

Fig. 7 shews a full size reed of the hautboy type, and above it, as looking down upon the tip of the reed, is seen the oval form it assumes after it has been moistened for playing. The two parallel lines indicate its appearance when dry. The make up of the reed is modern, but the size is of the old pattern as used by Italian peasants to the present day, spoken of as the pastoral hautboy.

Some readers not familiar with the instrument will be glad of this illustration showing the difference between double and single reeds. In the double reed, which consists of two slips of reed bound together, the vibrations take place only at the tips, and are caused by rapid changes from oval to parallel due to suction by the current of air driven down between them. It should be understood that in both the single reed and the double reed the action is the same in kind, and the vibrations or sounds result from the stream of air being checked in its progress by closure of the aperture by force of suction alternating with opening of the same by the resilient power or spring in the form and material of the reed—in other words vibration is due to shocks of arrested motion in extremely rapid recurrence—the number of repetitions of arrest per second constituting what we call the pitch of the notes or sounds.

Using either the hautboy reed, or the arghool reed, with these flutes, a scale of notes of some sort may be elicited. The narrowness of the bore causes so much difficulty in the obtaining consecutive notes by lip blowing, that I the least favour the supposition that the pipes were designed for such a method. The hautboy reed is almost always associated with a conical pipe ; but there are instances, in which it is used in connection with a cylinder of diameter quite as small as that of these pipes. We have no intimations that the Egyptians of that period (1100 B.C.) were familiar with the hautboy reed.

In any experiments with the hautboy reed the management of the reed by the muscles of the lips should be prohibited, as being a practice unknown to the ancients. My definite conclusions are that these pipes

are true specimens of the *di-aulos* at its earliest stage; that the slimness betokens a particular ceremonial purpose; that the pipes were designed for use with reeds of the arghool type; and that the distances between the holes indicate that the tones proper to the instrument are those of the four foot octave.

For the better command in the holding of the pipes the natural lay of the fingers is with the second joints covering the holes, the tips of the fingers not being used for the purpose until later times. Peasants in the wilder parts of Europe and Asia retain the ancient custom.

All the holes are oval in shape. The divisions of the four holed pipe are from top hole to fourth $10\frac{5}{8}$ in., to the second $1\frac{3}{8}$ in., to the third $1\frac{3}{8}$ in., to the fourth $1\frac{1}{4}$ in., to the end 3 in.; these together making $17\frac{5}{8}$ in. The division of the three holed pipe are from the top to the first hole $13\frac{1}{2}$ in., to the second hole $1\frac{3}{8}$ in., to the third hole $1\frac{3}{8}$ in., to the end $1\frac{1}{2}$ in.; making $17\frac{6}{8}$ in. The stalk knots of the reed are in each pipe at $6\frac{5}{8}$ in. distant from the upper end, and a knot is again found at the the extreme lower end of the four holed pipe, causing the opening to be partially occluded. This contraction would have a flattening effect and consequently the three holed (which is free from such a knot) is the longer of the two, evidently cut with the view to coincide in pitch with the other. Obviously also each hole from the top is larger than the one previous; this arises from the fact that, as stated, the pipes are not truly cylindrical, but narrow toward the bottom, and so they may require the holes to be enlarged to sharpen the notes; equivalent this to cutting the holes higher.

To the musician investigating these matters it is of

interest to observe that the two upper holes of the three-holed pipe coincide in their position with the two lowest holes of the four-holed pipe and consequently do not extend the compass of the notes, they merely pair the other pipe, yet if the reed of either differs, then, in flatness or sharpness the interval would show variation, and such an effect might be a designed one, giving a choice to the player. The lowest hole of the three-holed pipe extends the sounds that limit the tetrachord by one tone, and this method by extension reappears in aftertime in the Greek systems as an added tone also.

It is doubtful whether we are to consider that the open extreme end of a pipe is intended to produce a sound which is to be taken into the musical scale, even the least civilised people seeming to regard the note given as outside the designed series and not to be used; but it is easy to conceive how a pentatonic scale might have been developed by bringing it into use.

Another point to be noticed as affecting the pitch is that the distance between the fourth and the third holes is an eighth less than exists between other holes, and it may be that it was so intended to compensate for flatness, or to make a slight difference of interval.

The oval holes are not singular; I have several beautiful Japanese pipes with this feature in their construction. The coinciding holes of the two pipes may not have been intended to be identical in pitch or may have been used together to produce a quivering or voix céleste effect, through the partial shading of one by the fingers, and thus intended to give new resources to the skilful player. This is probable, because we find that at the present day the people of eastern climes are partial to this effect. The Egyptian *zummarah*, con-

sisting of two unison pipes tied together is played to produce it. It is quite easy to obtain the waving of pitch to a large extent, by using two reeds that differ in stiffness.

That the sounds given by the flute holes originally located by the spread of the fingers should prove to be distant from each other approximately by the interval we call a tone, is a mere coincidence as of numerical relation, the more or less extent being ultimately adjusted by experience.

Another consideration I must tell you of because in my studies of old customs in instruments it has been impressed upon me too strongly to be neglected, and that is the old world tendency that prevails to make flat fourths. In the section on Chinese instruments this feature will be noticed though I do not think any other writer has mentioned it, and I believe the duplicates of certain fourths are only apparently such and are intended for the making of fourths of slightly different pitch, and that there is a practice of using one of these for the ascent and the other for the descent in the scale. I believe it to be a natural racial tendency to make flat fourths and that by provision of another note with a difference, they to a tuning based upon fourths accommodate the obtaining of the true octave.

One of those pipes gives a complete tetrachord, a perfect fourth, the other extends it by a minor third, interveningly the flat fourth and the augmented fourth may be found within the scale of the two pipes combined. Not the Greek tetrachord but one of more primitive arrangement, before laws had been formulated for the relative degrees of tone and hemitones. There is also a leap interval of a tone and a half, which characterises

the earliest of lyre scales, and may be the link connecting the evolution of the Greek scale from the Egyptian. Indeed in Asia and Arabia similar usages still persist, and to the peoples' ears give content, they want no other.

The subject is so interesting to the musician that the further analysis and investigation to which these valuable relics of a past age have been submitted, cannot fail of helping to a true understanding of the significance of the Lady Maket's flutes, the oldest evidence of the world's earliest music.

And indeed how tenderly human is their appeal across the centuries, for they bear even now evidences of the touch of the fingers of the dear lady who played her chosen flute music upon them so long and lovingly, and cherished them as companions in her life, and destined them also to befriend her in her dark tomb. Yes, you can plainly see, her fingers have worn away the rich orange stain from the beautifully shaped oval holes. For these flutes were finely finished and designed for true musical service and durability. Originally they had been orange-stained and wax polished, and when first found held that appearance, but exposure to the air darkened the wax to a deep brown colour, yet the holes reveal in lighter tint how they have been worn by the fingers. Perhaps the lady musician had several other pairs of flutes, apt for the expression of joy and mirthfulness, and left them to her friends, taking with her only the one pair with which her *Ka* would mourn the loss of friends and the light of the sun.

A remembrance comes fittingly in this place, of another lady of this long vanished race. In a royal

tomb they found her, at El Amrah, wrapped round with the mystic robes of a ceremonial, that were to be her passport to the underworld during an unknown eternity; she was the daughter of Mena the founder of Memphis, and on her breast was written in the old hieroglyph letters, this simple message to the unseen power, who would judge her,—

"*She was Sweet of Heart.*"

—it was the last testimony of those who loved her. Sweet of heart, how near it brings her to our own loves. A touching epitaph to endure over six thousand years, —no woman could desire a more beautiful farewell.

The flutes that my thoughts so long lingered over are gone. They are deposited, after their strange travel, in the Ashmolean Museum at Oxford—a long way indeed from that land where the Lady Maket played them under a cloudless sky.

CHAPTER IV.

In the Land of Egypt.

MORE EGYPTIAN FLUTES: THE EVIDENCES OF THE SCALE.

The finder of Lady Maket's flutes, Mr. Flinders Petrie, did not coincide with me in the opinion I had formed on the method of blowing, mainly on the ground that no reeds were found with them. The objection loses its force if we consider that at all periods it has been customary for reed pipe players to have a reserve of reed tongues, and that to preserve the tongues after use it was desirable to keep them covered, that the air should not too rapidly dry up the moisture acquired during the holding in the mouth. At the present day, the players of oboes and bassoons remove their reeds from the instruments directly they cease to use them; and the clarionet player covers his reed with the cap even during a prolonged pause in the score for his instrument, for the same reason. Oboes and bassoons, when put aside, are deprived of the reeds, which are placed carefully in little cases which the players

provide for them, and carry about. So that we should not expect to find the reeds with the Egyptian pipes. Another reason, too, might operate; the *reeds* themselves might not be ceremonially required, as these flutes might have only a certain representative character. The learned Mr. A. S. Murray, late keeper of the Greek treasures in the British Museum, tells us that "it is noticeable that, among the vases of bronze found in tombs, the metal of some of them is so thin that they can do little more than stand with their own weight; they must have been produced expressly for show at funeral ceremonies." So long as custom was conformed to, the relatives of the deceased were not called upon to do more; and the exact significance of what was done we of a different race cannot estimate.

Taking a practical view, we are justified in the conclusion that the Egyptians had boxes for the safe keeping of these reeds, for the Greeks, who seem to have carried forward the customs of the Egyptians, had such. Mr. W. Chappell states that these reed boxes, called *Glossoocmeia*, had a sliding lid top like a modern common domino box; and, according to Hesychius, the small reed tongues agitated by the breath of the performers were called *glottis*. Dr. Stainer, in his "Music of the Bible" says :—

> The very existence of the word "tongue box" shows that the player was accustomed to carry his tongues or reeds separately from the instrument. The word, it will be remembered, is used in St. John xii. 6 and xiii. 29, where it is translated *bag;* but it is quite possible Judas Iscariot carried the money in a *reed box*, as implied by the Greek text.

And we may add, also, that from this explanation the inference may be drawn that very probably Judas Iscariot was a musician.

The Lady Maket's flutes are the true representatives of the double pipes, called by the Greeks *diaulos*, and by the Romans *tibiæ pares* and *tibiæ geminæ*,—the latter a very appropriate name. These twin flutes are profusely depicted upon Etruscan vases, being introduced almost invariably in banquet scenes: wine and music inseparable. The master and guests recline on couches; but the flute player is always shown standing, as in attendance for their pleasure.

Fig. 8.

Egyptian Player on the Double Pipes.

The chaining at the ankles indicates that the players are performing some act of homage.

With the Egyptians it was different; with them chiefly the domestic alliance was dancing and music, and no doubt this difference in custom affords us an index of the characters of the two peoples.

How great the contrast; the wine-loving, laughter-loving, Greeks, living in the open day, buoyant of life, and always eager for contest whether of muscle or of brain; and the Egyptians, shadowed through day and night by the colossal calm of their temples, secluded in family life, adding store to store, possession to

possession, and placidly working for the day that is, yet ever caring for the morrow after death.

This player has pipes of unequal length, is evidently taking part in some ceremonial, and is wearing a trailing scarf of vine leaves, which had its significance in the sacred rites. The long pipe seen in this ancient example of use is possibly the prototype of the later form seen in the Arab arghool, with its long drone pipe, and it has therefore a very interesting significance.

Fig. 9.

Player upon Unequal Pipes.

In the Egyptian wall paintings which we have in the British Museum are two domestic scenes; and in both the damsels are seen seated on the ground in oriental fashion, and they are playing on double flutes, whilst other damsels are dancing to their music. The picture belongs to the time of the eighteenth or nineteenth dynasty, about B.C. 1,600, and was taken from a tomb at Thebes. The date is five centuries before Lady

Fig. 10.

From the Wall Painting to be seen at the British Museum.

Maket was born. This painting is about thirty inches long, and illustrates a musical entertainment. Girls are dancing, other girls are seated and are clapping hands to time; and another is seated, in full face view, playing the double pipes, which are slightly conical, and reach lower than the elbows of the seated figures. The player has rings on two fingers of the left hand, and the little finger closes on the pipe with the second joints of the finger. The pipe appears to be about twenty-four inches in length, possibly more. The proportion may be judged, since the seated figure measures from the crown of the head to floor $8\frac{1}{2}$ in., and the pipes shew $5\frac{1}{4}$ in. long; and the mouthpieces in white (as if of ivory) to each slender tube; and these may carry the reed which is hidden in the mouth, for in a custom of later time we find that ivory reed holders were used. It is curious to note that the right hand of the player taking the highest position, supports the right flute between the hollow of the thumb and the forefinger; but the fingers cross over to play on the left hand flute, whilst the left hand similarly reverses and plays on the flute of the right. The Egyptians called these twin flutes "Mamms."

In another painting on the same wall a girl is playing the double pipes, and is accompanied by others with stringed instruments. The figures are seated with legs folded under and in this position the pipes reach nearly to the floor. The pipes are but little beyond the cylindrical form, and evidently have some joining mouthpiece, in this instance of a reddish yellow colour, and not white. The crossing of the hands is also found in this picture, and one notices how ingeniously convenient the method was, and how the grasp by the ball of the thumb

steadied the instruments when playing in such a sitting posture. On neither of the flutes is there any marking to indicate the finger holes.

The great length of the flutes in these paintings led me to the conclusion that, as I have stated, the Lady Maket's being considerably shorter and so slim, are properly funereal or wailing flutes. Curiously enough we already possess a pair of these flutes in the Museum; but even to my enquiring eyes the truth was not revealed until the Lady Maket's flutes taught me what to look for. So true is it that the eye only sees what it is prepared to see? I knew that three straws with holes were stuck in a rack; looked at them after I had handled Lady Maket's pipes, and saw nothing more than one straw pipe very similar. At last it suddenly dawned upon me that another straw was very likely half a pipe, and a further scrutiny leaves no doubt that it is the complemental pipe, the upper part missing, broken off below the middle knot.

With the usual perversity attending the exhibition of musical instruments, this broken pipe was so placed as to be, in relation to its companion, as the horse with its tail where its head ought to be, and was thus passed by without understanding. The length complete, as near as I could measure is fifteen inches; and if the broken one should be placed end for end parallel to the perfect one, the relation would be apparent; the lowest holes of each being the same distance from the end, three inches, and so corresponding to the Lady Maket measure.

In the national museums at Leyden, Berlin, Paris and at other continental museums, there are straw flutes or portions of them; but how much they are from

good condition I do not know. So far as I am aware the pipes found by Mr. Flinders Petrie are the only existing *perfect* specimens of the Gingroi or wailing flutes.

By the term straw we merely indicate slenderness; the pipes being truly reeds, called by botanists *Arundo Donax*, and also, *Sativa*. From this kind of stalk our oboe and other reeds are made, the chief European supply coming from Fréjus on the Mediterranean.

When these pipes first came into my hands for examination and measurement, I at once expressed my belief that they were sounded by Arghool type of reed; when the right reed, I said, is discovered after numberless experiments, then we shall have better surety of an exact scale as heard by Egyptian ears, with perhaps the proviso that somewhat of the skill of the player of the old race is attained.

THE TEACHINGS OF EXPERIMENTS.

As there are no known existing examples of the *Diaulos*, the extreme interest attaching to the Lady Maket flutes as the original representatives of the later use of the Greeks, justifies the fullest investigation of the scale they give into our hands, with an enduring testimony of truth, that goes beyond that afforded by painting or written record.

Very greatly esteeming the permission given to me to measure and take the particulars which I have stated, I made all haste to get models made for me in metal upon which to investigate the scale.

My experiments were made with arghool reeds and metal pipes, copies of the originals as nearly as possible the same in bore. I obtained for the ground tone

of the pipes, B in the eight foot octave; and, in this order, the tones following:—

1st pipe.....B———D—E—F♯—G♯.

2nd ,, ...B—C—D—E.

The pipes being cylindrical in bore with a true transport of air through them, are subject to the law displayed by the clarionet, sounding an octave lower than like length open organ pipes or lip-blown flutes.

Then for harmonics I obtained the double octaves, with sometimes a slurred intervening single octave, passingly heard in the rise to the double octave. This is curious, though not unexpected when one has been accustomed to the seeming vagaries of reeds. Practically, nature does not always proceed according to academic rules. When reeds are combined with pipes, the resulting pitch is due to a compound of two forces pulling in opposite directions; the reed drawing to high pitch, and the pipe to low pitch, each acting upon the other. Some reeds will not yield to the coercive effect of the pipe more than to about the extent of a fourth, with preservation of real truth of intonation; and at such limit the reed flies back to the starting pitch and recommences, or plays false. A free reed will not bear to be drawn down by the pipe associated with it to more than an octave; and if attempt is made to cause it to respond lower in the scale (by a greater lengthening of pipe), then it makes a jump back to its original pitch. After that there are other curious relations, such as not responding beyond a fourth, and so on; particulars of which need not here be gone into. Therefore, discrepancies in experiment need not cause surprise.

Simultaneously Mr. T. L. Southgate and Mr. J. D. Blaikley, attracted to the same pursuit, entered upon a course of experiment, the results of which were set forth at a meeting of the Musical Association. Mr. Blaikley is well known in connection with wind instruments, and his judgment upon musical pitch may be absolutely relied upon; and Mr. T. L. Southgate is also well known as a keen investigator in all musical matters; and as an aid to his own knowledge and skill he was fortunate in obtaining as an associate in these experimental researches, the practical experience of Mr. Finn, who, accustomed to flutes and hautboy reed instruments, could bring into use the little artifices in producing sounds from the reeds which the amateur in wind instruments lacks knowledge of.

The summary of the results arrived at, shows for the

1st pipe..... E♭———G—A♭—B♭—C♭

2nd ,, ... E♭—F—G—A♭

These were obtained with a small straw reed. (The E♭ is the third space in the bass clef). Nearly all the intervals prove to be less than ours, and are, as we should term them, flat. The experimenters used small straw squeaker reeds, and also *Arghool* and bagpipe reeds, the results in each case differing. So that, unless we can ascertain more definitely what sized reed the Egyptians had in use, the pitch notes arrived at are but approximately right.

That my own experiments bore a lower estimate of pitch is due to my using ordinary arghool reeds, heavier than could by any supposition have been fitted to these little pipes, yet the relative course of the sounds produced is seen to be the same, and therefore is con-

firmatory of the use of that particular kind of reed, and in accordance with known laws of the reed and pipe, so that my first guess or calculation, founded upon the length of the pipes, was correct. The length of pipe $17\frac{3}{4}$ inches, to which add $1\frac{1}{2}$ inches for length of reed. This is the sound of the full length of the pipe, note

The relations of the notes, one to another, as ascertained by Mr. Blaikley, are in close correspondence with the harmonic scale as elicited from the horn or trumpet, from the high D to G; and also the scale of the highland bagpipe has its succession of notes in similar relations of pitch. This harmonic scale is here given, so that by comparison the relation may be understood.

The four holed pipe gives	*vib.* E♭ 160			G 194		A♭ 213	B 233		C♭ 257
The three holed pipe gives	E♭ 160	F 177		G 197		A♭ 215			
By harmonic scale	E♭ 160	F 177·8		G 195·6		A♭ 213·4	B♭ 231·2		
(the increment is 17·8)	9th	10th		11th		12th	13th		

Note by note the natural harmonic scale ascends by an equal increment, differing essentially from the diatonic, which only doubles its number of vibrations at the distance of the octave. Thus, although the sounds of the above are given by name, as near as can be stated, yet it is a notation for convenience only.

The general reader will best understand the matter as estimated to me by Mr. A. J. Hipkins. From E♭ to G is a bagpipe, or neuter third,—from this G to A♭ is a ¾ tone,—the A♭ is therefore a perfect fourth from the E♭. The G being a quarter tone flat, it makes with the C♭ a small or flat fourth. The fifth lying between F and C♭ is also very flat, in fact equal to a tritone. The remaining notes are two ¾ tones, which land us at C♭, a minor third from the A♭. An arrangement very appropriate for wailing. The Greeks also it should be remembered had ¾ tones.

These particulars have great interest in musical enquiry, and help us to see how fortuitous has been the growth of the scale, and how characteristically "*minor*" the music of different races seems to us, whilst in reality quite outside our scale and distinct from it in development. The flat fourths I have found to be persistent in Chinese music, and for very good natural reasons, as will be fully shown in subsequent chapters on the Chinese ancient instruments.

The very low sounds given by these flutes are necessarily weak and have no penetrative power, nothing like what we should expect to be adequate for ceremonial use, or for the purposes to which we imagine the flutes applied in public life. A procession, for instance would, by the mere noise arising from walking drown the sounds, unless the walkers trod in sand. The conclusion I am driven to is that the skill of the players was devoted to eliciting the shrill harmonic tones, and that the low range of tone was seldom brought into requisition. The length of the pipes suggests this view, and the extreme slenderness seems to be adopted for the purpose; since it is inimical to

volume of tone, yet favours under strong breath pressure the eliciting of high tones. Any day some new discovery may confute our speculations; but still we cannot but indulge in them. We, with modern eyes, look upon these flutes only as musical instruments; but to the Egyptians every tone heard alone or in combination, every movement, every gesture of the player had its mystic meaning, and its occult significance in association with rituals and observances and ceremonies.

In these early ages, double flutes appear to have flourished everywhere amongst neighbouring nations; and the single flute, if the pictured representations and designs are to guide us, was comparatively rare. We note the fact, but, as to why the double flute was popular, we are quite in the dark. Egyptians, Assyrians, Babylonians,—which nation first had them? Far back as our spoils from the ancient cities and tombs and palaces and temples may date, it is very certain that the double flutes had their origin in far earlier times, and had passed through periods of evolution from some type ruder than the instruments which we find depicted. I have remarked how the added tone furnished by Lady Maket's flutes indicates a large advance in the progress of civilization in her day, for probably flutes without such had had their run of popularity, perhaps centuries earlier. So that, when we speak of primitive pipes and primitive tetrachords, we think of long anterior dates, long before the particular instruments were fabricated which we have cognizance of. Advance is very slow.

We should remember the great gap of time—two thousand five hundred years—before men arrived at the

idea of a simple lever key to extend the scale of oboes and flutes by one note; and then think of the possible interval between the time of early common use of pipes comprising four tones in their range and the advent of a pipe with one finger hole and one more added tone. May be in the popular tradition, some young god invented it. Think of the commotion amongst the Greeks when a daring innovator added one more string to the lyre!

The Egyptian double flutes seen in the paintings are of greater length than those used by the Assyrians, who so far as we can tell, from their incised tablets seen in the Nineveh Gallery in the British Museum, had only short ones. It was in the hands of the Greeks that changes began to be made, the first noticeable feature being the greater diameter of the pipes. It was not until about five hundred years after the death of Lady Maket that Egypt was opened up to the Greeks; all foreigners had been previously most rigidly excluded. The Egyptian instrument called the *Arghool* is a comparatively modern instrument, for we never find a trace of it in ancient paintings; and the drone, which is its chief feature, was most likely an Arab device founded on the long pipe of the earlier Egyptian (see page 45, Fig. 9).

But the *Arghool* reed itself had a very ancient origin, and we rightly consider it the oldest of reeds, and as essentially belonging to the Egyptian double flutes. If you look at the engraving you will see that, at the top of the pipe itself, a short piece of smaller pipe is inserted; and, again, a piece of still smaller pipe is added in which the reed has been cut. Thus there is, as it were, a double step, ingeniously accommodating the fitting in of the reed in the simplest way.

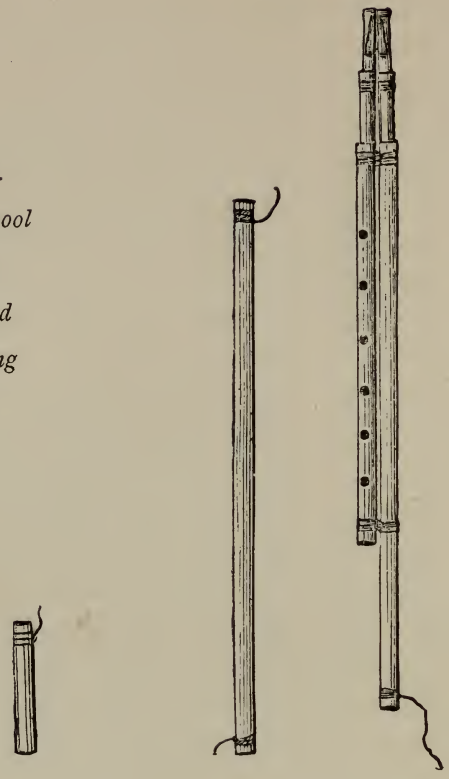


Fig. 11. The Arghool with its drone and lengthening pieces.

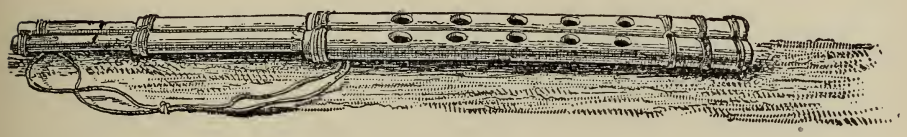
Instead of having pipes with different sets of holes, this has but one pipe, and it has six holes, therefore employing the fingers of both hands, the second pipe which is without holes is bound to the shorter pipe, and has two or more lengthening pieces which are used by the player, according as the custom has determined for the particular air played, for this holeless pipe is nothing more than a drone pipe of deep tone, such as a bagpipe has ; some idea of harmony must be involved since the small lengthening piece increases by about a tone the depth of pitch attained. One curious custom should be noticed, the attachment of the portions to one another lest they

should be lost ; the tongued reeds that are placed in the players mouth are tied in the same manner by rough bits of string. In the wilder parts of Asia horsemen travel carrying with them a hautboy kind of instrument with four or five extra reeds, strung in a chain fashion and loosely hung round the neck of the pipe for use when a new reed is required, or a choice of one of different quality of tone is desired.

There is another popular native instrument, much more ancient than the arghool called the *Zummarah* it consists of two pipes tied together (not to be called

Fig. 12.

The Egyptian Zummarah.



*double pipe*s) the holes in each being the same in position and the same in number, five. Some representations of very archaic kind, carved, have been found, I do not remember any paintings in old Egypt, but Mr. Flinders Petrie has discovered two specimens in the Coptic cemetery at Gurob, complete with the reeds, and the date of these is given about A.D. 500. The question arises, were such pipes in use at any period earlier than our era A.D. and if so, how near to the time of the Lady Maket ?

The tonality is the old Egyptian.

Another kind of flute in primitive relation is seen figured in Egyptian paintings ; it is a single long pipe, held aslant, and sounded by blowing across the tip

obliquely. It was called *seba* or *sabi;* and the open, slant-cut, tip end is thinned off to a feather edge.

Fig. 13. The Seba or Sabi.

The representative national pipe now in use is called the "Nay." This pipe is about fourteen inches long, and it is only in the method of blowing that it corresponds to the ancient pipe.

The various kinds of flutes we see depicted by the Egyptians in their paintings, were used in concert with other instruments—lyres and grand harps in pairs, capable of giving fine volume of tone—through which the flutes would have to be heard, although not perhaps so simultaneous was the playing, as with us; since there are reasons for believing that their orchestration was more in the nature of alternation of instruments, one class leaving off and others taking up the strain and only occasionally combining for fulness or strength, associated perhaps with the voices of the multitude in popular acclaim. In later days in Egypt's decline, it is on record that Ptolemy Philadelphus employed a band of 600 musicians to celebrate the feast of Bacchus.

Fig. 14. Arab Player on the Nay.

In India we find flutes which seem to show a compromise or blending of the tip-blown and side-blown methods. In the India Museum some pipes may be seen with a curiously shaped hollow tip, cut with a slant curve, across which the player blows. These several ways are but different illustrations of one and the same principle—that is to say—the stream of air blown *across* the hole creates suction in the pipe, which reaching its limit is constantly broken with a rapidity of action resulting in periodic vibration of definite sound or pitch.

On the walls of one of the Vase Rooms in the British Museum are displayed, running almost the length of the central part of the wall of the room, two wall paintings. The period is called Archaic, and the figures have a formality which contrasts with the

freedom of design in a later period. In each painting, which is a facsimile from an Etruscan tomb at Corneto, there are two male flute players, and women dancing to their playing ; and all the flutes they are using, and which they hold trumpet like before them, show reeds of the *arghool* kind, the double step I pointed out just now being plainly marked, and the upper one in each instance coloured a brown olive, whilst the pipes are white. Seen through an opera glass the details are very distinct. One pair of pipes has three holes in each pipe marked. The pipes are thicker and shorter than the flutes in the Egyptian wall paintings described above, and we find that similar proportions are apparent in some Assyrian wall designs. In the tablets of Assurbanipal, date B.C. 650, the double pipes are short and are conical, which is quite a distinct feature in double pipes, and would cause the sounds to be an octave higher in pitch.

The two extremes I have cited, during which the double pipes of the original style are in evidence, cover a long period, the wall paintings of the time of Thotmes the Third and the carvings on the Sanchi Tope gate—that is from B.C. 1600 to about A.D. 100. During all these centuries, the double flutes have entered into the national life of many peoples, and at various times concurrently one or other of the varieties I have named have likewise been in popular favour. One remarkable period, however, there was, when an innovation intervened. A new Greek invention appeared, and held the field for several centuries. Etruria, about B.C. 500, seems to have been the place of origin of the new double flutes ; or it may be said that here they come first into historic presence. On this Italian plain a

Greek colony settled; and we consequently term these flutes Greco-Etruscan flutes, the distinguishing features of which have been preserved for us on the marvellously beautiful vases that were buried in their tombs,—death being the preserver of empictured life.

Here then we leave the valley of the Nile, and, after an interval of six centuries from Lady Maket's decease, view another and a distant region, amid a new state of civilisation. One lingering touch of association with the Lady Maket's flutes is found in Miss A. B. Edwards's description of a funeral in Egypt in the year when she travelled "One Thousand Miles up the Nile."

At a funeral in Nubia, the ceremonial with its dancing and chanting was always much the same, always barbaric and in the highest degree artificial. The dance is probably Ethiopian; the white fillet worn by the choir of mourners is on the other hand distinctly Egyptian. We afterwards saw it represented in paintings of funeral processions on the walls of several tombs at Thebes, where the wailing women are seen to be gathering up dust in their hands and casting it upon their heads just as they do now. As for the wail—beginning high and descending through a scale, divided not by semitones but thirds of tones, to a final note about an octave and a half lower than that from which it started—it probably echoes to this day the very pitch and rhythm of the wail that followed the Pharaohs to their sepulchres in the valley of the tombs of the kings. Like the *zaghareet* or joy cry which every mother teaches to her little girl (and which, it is said, can only be acquired in very early youth), it has been handed down from generation to generation, through an untold succession of ages. The song to which the Fellah works his *shadoof*, and the monotonous chant of the *shakkieh driver*, have perhaps as remote an origin; but of all mournful human sounds, the death wail that we heard at Derr is perhaps one of the very oldest,—certainly the most mournful.

From this vivid picture of real life we can now understand that our little wailing flutes, recovered from

that rock cut tomb, meant very much to the old Egyptian race.

A piece of the old poetic writings comes to me at the time present, that seems to complete the circle of our thoughts around this long lost nation—it comes from old Chaldea, the motherland, is one of the choice and highly valued finds of explorers, recently acquired by the British Museum,—tablets of popular songs of Chaldea which date at least B.C. 2300, and possibly earlier. These are distinctly called songs. One bard says,—

I will sing the song of the Lady of the Gods;
Listen the great ones,
Attend ye warriors,
To the song of the Goddess Mama,
The song which is better than honey and wine.

In fair reason may we not conceive that through long ages tradition held its sway amongst the people, and that these pipes were dedicate to the goddess Mama, were given into the hands of women to play and to cherish the melodies of songs that belonged to their race, and that they named the twin pipes *Mamms*, in affectionate reverence for the "Lady of the Gods" whose song was better than honey and wine.

CHAPTER V.

In the Land of Etruria.

THE GRECO-ETRUSCAN DOUBLE FLUTES.

THE BULBED OR SUBULO FLUTES.

The Song of Linus is heard to-day in the land of Egypt; the sacred melody played on the double flutes in ancient days survives without change, but no player on these pipes exists; the song is sung in wailful cadence by lips of another race, for the old race has vanished

in the long corridors of Time.

Strange is the irony of history! The dwellers in the land have forgotten the name of their song, and call it after a Greek myth. Yet, in its origin, it was a very real song of lament, a true outcome of human sorrow, age remembered and treasured in the hearts of the old Egyptian people, and perpetuated by tradition even amongst those who were strangers in the land, who tilled the soil, and lived in the ruins of the past.

It was a lament for the king's son, known as the Song of Maneros, so that grand old interviewer, Herodotus, tells us. He had thought this Song of Linus to be a famous song of Greek origin.

This is what he says:—"I have been struck with many things during my enquiries in Egypt, but with none more than this song, and I cannot conceive from whence it was borrowed, indeed they seem to have had it from time immemorial, and to have known it by the name of Maneros, for they assured me it was so called from the son of their first monarch, who being carried off by an early death, was honoured by the Egyptians with a funeral dirge, and this was the first and only song they used at that early period of their history."

Plutarch says Maneros was the child who watched Isis as she mourned over the body of Osiris.

Herodotus is constant in admonishing the Greeks that Egypt is the mother of wisdom, and that for a vast deal of the learning and the arts they pride themselves upon they are indebted to her by direct inheritance. What he, a Greek himself, in his day told them we have found true, and in all the light of modern researches the old historian is well supported. We are accustomed to locate Egypt on a few hundred miles on the banks of the Nile, losing sight of the fact that, in the days of her dominion, her power extended far and her influence was felt in all the lands bordering the Mediterranean wherever civilization held sway. Her royal dynasties were a living force for thousands of years.

One startling record was discovered by Professor A. Sayce. He tells us that he has read the graven tablets of Tebel-Amarna (now in the Berlin Museum), which

prove to be letters sent from the king or governor of Jerusalem to the Egyptian sovereign, in the century before the Exodus. This governor owed allegiance to the Egyptian monarch, and his letters were dated from "'the city of the mountain of Urusalem, the city of the temple of the god Uras, whose name there is Marru.' Thus long before the days when Solomon built the temple of Yahveh, the spot on which it stood had been the site of a hallowed sanctuary."

Along the whole Asiatic coast of the Mediterranean the Egyptians had their military settlements, and consequently there ensued a mingling of many tribes and races. The Greeks, or as they came to be called, the Hellenes, were a composite people with a Pelasgic basis. There was, however, distinct Egyptian colonisation. Cecrops is said to have led a colony from Sais in Egypt and to have founded Athens in 1556 B.C., and Danaus, who seems to be a brother of Amunoph III., is also said to have left Egypt and to have founded Argos, of which he became king, and died, B.C. 1425.

The perpetual trading that was going on between the Phœnicians, Greeks, Italians and Egyptians, brought the land of Tuscia under the influence of Egyptian ideas, and of this the sepulchres of Etruria give ample evidence. The domestic life, the industrial arts, the religious rites, the paintings and sculptures, and even the mode of burial, all are exhibiting new adaptions of older faith and customs; the different development being due to differences in race, soil, and climate, to inheritance and environment. If we look back far enough we shall find that the geography of the country, the outcome of its geology, forecasts the destiny of its inhabitants and writes the history of its peoples.

Of all the variety of vases fashioned by Greeks and Etruscans, the types of the different forms we find existed long before in Egypt, and these vases have been buried in tombs—large underground chambers that are the counterparts of Egyptian tombs—and they have been placed there to please the spirits of the dead, by devoting to them the things that were most loved, most prized, during life. They used the sarcophagus, though they did not mummify or embalm the dead, but laid out the body dressed in its garments, or encased in armour of the period, with strappings of copper and bronze bosses for breastplates, placing it on a stone bier surrounded by its treasures, often of great value, and leaving it to moulder into dust by natural decay. The paintings on the walls of these dwelling rooms of the dead illustrate banquets and scenes of domestic and public life, and afford us most valuable indications of the ways and manners of long past days. A large number of these chambered tombs have been opened, with their treasures untouched since the day of burial. The first that was discovered was by the chance pushing aside and uprooting of a bush by a peasant tending his goats at evening, who, looking through the opening he had made, the setting sun throwing its light into the chamber, was seized with mortal fear at the sight his eyes fell upon ; rushing home to his people he described what he saw, the body lying there dressed in the habit as it lived. The next day, however, no body was there, only the figure of it in little heaps of dust, and the metal links and the two round breast bosses fallen, indenting the dust. Those who explored the tomb and recovered its treasures were inclined to the belief that the peasant did see the human form, but that, as

in similar cases that are known, it collapsed upon the admission of air and light.

The tombs were rock hewn, or built of stone and then covered with earth appearing as mere tumuli. The chambers many of them being twenty feet by twelve, and superstition asserts that in more than one instance lamps were found still burning with perpetual fire although fifteen or twenty centuries had elapsed since they were lighted.

The painting described in the last chapter, copied from one in a tomb at Corneto (meaning at the necropolis of Tarquinii, the ancient city) shows very clearly that the earliest double flutes possessed by these people were of the Egyptian kind, with a similar form of reed; and this same design I have also found on one or two vases, and also evidently the same style is meant in other instances, in which the details are not worked out, in both paintings and vases. Thus far we trace the connection between Etruria and Egypt as regards the flutes, with Greece as a continuing link.

The people of Etruria were an ancient race, occupying both sides of the Appenines, they are now believed to have been Pelasgian Tyrrhenians, they had great naval power, and in origin were related to the old Egyptian stock, or, as some say, to both Lydian and Lybian. How long they had inhabited the Tuscan land we do not know; they displaced or absorbed an earlier race, as is the custom of invaders. They spread southward as far as the Tiber centuries before Rome was, and founded a city called Tarquinii about 1040 B.C. Etrurian kings ruled at an early time in Rome, probably up to about 500 B.C. The immense cemetery of Tarquinii is all that remains of the ancient city, which is

now succeeded by the Corneto city, built close to the old site.

The Etruscans it is judged came about 1200 B.C. They attained renown in bronze work and in pottery (remember here that the Lady Maket flutes date about 1100 B.C.). Historians state that Greeks from Thessaly entered Italy from the Adriatic side and introduced by their influence the higher development of art into Etruscan work. Be that as it may, there is no doubt cast upon the historical record concerning one Demaratus, a merchant of Corinth, who made great wealth by trading with this old city Tarquinii. He migrated 657 B.C. and settled there and married a lady of noble family. His two sons became famous in Roman history. He had views upon Art, and brought with him from Greece two potters and one painter and thus did good service to the land of his adoption.

Another influx of Greeks is recorded. This colony of Greeks came, however, in a peaceful fashion, and settled there, having fled from a plague or famine in their own land, in Lydia.

That the Etruscans constantly went to and fro, visiting the chief cities of Greece, is manifest, since many vases bear official inscriptions that they were prizes won at the Dionysian festivals, and at the Panathenæan games. The knowledge of these facts adds wonderfully to the interest in these vases, and enables us to understand something of the feelings which induced the burial of things that were valued personal belongings, and caused on the walls the paintings to be limned of banquets and races, and wrestling contests and musical contests, in one or more of which probably the dead man had won renown.

The musical instruments on which they excelled were the double flutes, the trumpet, and the lyre, and on these they have conferred an immortality by the ceramic art which they carried to so high a state of perfection.

I have in the matter of dates brought together a few points which I would have you look upon not as mere antiquarian lore, rather as connecting our thoughts in a survey of the progress of music, and to give an idea of the association of these three peoples, Egyptian, Etruscans, and Greeks, in its development. You should keep distinct in mind the early Etruscan period under Egyptian influence, and the much later period when Greek influence had sway from 600 B.C. to 300 B.C. It is this later period of Art that we are now entering and a very remarkable one it is.

Etruria has given us a new thing: this is the *subulo* flute, the new Greco-Etruscan flute. It is a mystery that has not been fully solved: and, although I have my theory about it, as you will find, and have regarded these flutes very lovingly, scrutinizing every vase with a most personal affection, yet until some actual specimen is recovered from the past, I am denied that supreme satisfaction desired by the ardent investigator, —proof. Before I began many years ago to state my impressions concerning the indications given by these vases, I do not know that anyone thought the matter worth notice, or said "Here is a new invention in flutes." The peculiar feature of the construction is the presence of *one, or two, or three bulbs,* or cocoon shaped terminations at the upper ends of the two flutes. The peculiarity in the form was generally supposed to be ornamental, and an artistic way for lightening the

upper part of the pipes ; or, at most, a piece of decorative conventionalism. The learned saw no purpose behind the appearances, and therefore the idea of device or constructive design was not to be entertained. The illustrations here given are copied from figures depicted on the vases in the British Museum, and you will notice no longer the straight conjunctive tip-pieces of the step-like pattern the *Arghool* fashion of Egyptian flutes as displayed in the Corneto painting. That

Fig. 15.

fashion has become old, it is out of date. Suddenly a change has come without a sign, in the home settlement in Tuscany. Centuries probably intervene, and a new influx of settlers arrives, this time of pure Greeks or Hellenes.

One of the illustrations I give is taken from a representation on a vase of a flute player at a musical contest. He wears a *phorbia* or *capistrum*, which is a kind of leather bandage or bridle, used in precaution lest he should burst his cheeks in blowing ; and the

band has two holes pierced at the mouth for the insertion separately of the pipes. The fact of the use of the pipes in the band separately is beyond question, since the actual pattern of the band exists in a relic from Cyprus in the Cesnola collection at New York, and the holes in it are not large enough to admit the bulbs, but only the tip portion as shewn here. This player, as you will notice, is playing one of the new double flutes,—not an Egyptian flute.

Female players also used the phorbia in playing. Dennis notes on a vase "an *auletris* with black hair, and a *phorbia* over the mouth, stood by the bier playing the double pipes"—thus keeping up the Egyptian custom.

The reeds are not now taken into the mouth. Drawings of the *Arghool* should have shown that each reed was, at the tip, tied to the pipe by a slack rambling string, for by these bits of string each reed is connected with its pipe lest it should be lost. This is shown in the Summarah drawing. Enthusiasts newly trying the *Arghool* are very ready to drop it, since they soon feel sick from the unpleasant sensation of the reeds and the loose bits of string in the mouth, and it is an experience one remembers.

Come with me to the Vase Rooms of the British Museum and look at some of the spoils of Time. Mr. Dennis in his beautiful work on the Vases of Etruria says "the enormous quantities of the vases that have been found in Etruscan soil, within the last fifty years alone, may be reckoned not by thousands but by myriads."

In these rooms— and there are three large rooms devoted to these specimens of fictile art—there are some

hundreds of vases. Many hours I have spent amongst them, brooding over their beauty, and wondering of the tales they told of a people long passed away and a religion once the glory of the earth. On numbers of vases flute players male and female, are depicted, sometimes three or four on one vase; and the various attitudes I observed, and the indications of purpose they betokened, led me believe that there was some meaning beyond mere ornamentation in the cocoon like bulbs of the flute heads. I examined minutely vase after vase, and discovered at length three vases on which were delineated players handling their flutes each in a different manner, and these conveyed clearly to my mind the conviction that the bulbs were detached pieces which the player was able to arrange. Then arose the question in my mind," for what purpose?" You have the three pictures before you. Now it is very curious that only by means of the Greco-Etruscan art work are the *subulo* double flutes brought to our knowledge (for distinction, it may be well to give these bulbed flutes the name by which the Etruscan player was called); and yet the period during which this new invention was in vogue, comprises that in which Greece was at the height of her intellectual power. The age of Pericles and Phidias, of Plato and Euripides, of the rearing of the Parthenon and of the grand Temple of Jove at Olympia!

The dates of the vases of the best period, all are included between 440 and 330 B.C.; some earlier, also showing these flutes, date back fifty years more. Thousands of these recovered vases are distributed in museums and private collections, and have been of inestimable value for the insight they have afforded into the domestic

life of the Greek people. Aristophanes in one of his comedies, written about 450 B.C., makes a bit of satire out of these flutes, causing Micas and another to say—comically complaining of their master—"Let us weep and wail like two flutes breathing some air of Olympos." All that their poets and other writers told us of their flutes and flute-players fails to come home to our understanding until associated with these enduring pictures; and we know at least that *they* are genuine records, and that time has allowed no hand to tamper with them. It is evident that flute music exercised a fascinating influence over these people; the player is present alike in scenes of mirth and revelry, in solemn ceremonials and in funeral procession; and yet we are so far away in thought culture and sentiment, that we are unable to imagine what that music was that it could give such delight, and be accounted one of life's chiefest luxuries. Here, beyond question, we have the testimony of the of the eye that it was so; and we know that the natural laws of sounding pipes are the same to-day as yesterday, and the limits of capability of four or six holes allowed but a very narrow range for melody.

The player was called by the Etruscans "Subulone": by the Greeks "Auletris" and the flutes known as "Auloi." The pipes were formed of boxwood, lotus wood and sycamore.

Was it on these double flutes that Lamia played and so 'witched the world that it built a temple to her, and paid divine honours to her name? Were these the flutes spoken of as being able to play in three modes, the famed flutes, the invention of Pronomus the Theban? The date given of Pronomus is given as about 440 B.C., and is that of the period of these vases.

The sportive fauns and the lush-eyed satyrs of the woods have indeed learnt the mystery of these pipes and make merry under the vine-leaves. I have in my mind's eye now a curly-headed satyr handling the pipes, and I wish that I knew the charm to bring before you the saucy curious look with which he is regarding them. All that modern exigencies allow me I give here,

The Satyr's Hands and Flutes.

Fig. 16.

just the hands and the pipes. Notice the expectant thumb; what is it he is contemplating? What is he about to do? He intends to press the bulb of the pipe, but evidently something is wrong, and I am so anxious to know what it can be. Then there is a short line on the top of the furthest pipe; it was a puzzle to me years ago, and the satyr and I we are still puzzling over it. Each pipe has but one bulb, and I think very probably these simple creatures of nature would be unable to manage more. Four oval holes are given to each pipe, the artist has so marked them, and the firing that

the vase underwent in the kiln retains them with indellible truth. When I see on wall paintings that finger holes are marked I am doubtful, because it may be the work of an overwise restorer, and so of copies of the wall-paintings on the tombs ; and, indeed, I am sorry to know that modern painters and engravers are not trustworthy in details, but palm off home made suppositions about the proper finish of musical instruments, the nature of which they do not comprehend. They are ignorant even of any necessity for comprehending such simple things.

I was looking over a valuable book on sculpture yesterday, in which highly finished delineations were given of the friezes of the Parthenon ; in one engraving four flute players were represented each playing a single pipe. I was dazed; wondered if my memory had played me tricks. So I went and looked at the marbles, and sure enough I was right ; the sculptor had carved two hands and two pipes in the natural way of the double pipes ! At that period I should not expect to see the single pipe, and I do not remember on any Etruscan vase a player on one pipe only. Neither should one expect to see the bulb form represented here because the straight form suits best the sculptor s art ; and in marble vases, also, the double pipes are quite plain as may be seen on a beautiful vase in the entrance hall of the British Museum. Read Keat's poem, " Ode on a Grecian Urn," and then go and look on this marble picture of

The happy melodist, unwearied,
For ever piping songs for ever new.

Or if you are denied that delight, read those five stanzas of a poem that will be immortal as the memory of our

race, and will outlast the marble beauty it realizes; read it in quietness, and then, in Keat's sweet words,

With eyes, shut softly up alive,

the scene will grow within you, as that pale singer heard it, singing

Heard melodies are sweet, but those unheard
Are sweeter; therefore, ye soft pipes, play on;
Not to the sensual ear, but more endear'd,
Pipe to the spirit ditties of no tone;
Fair youth beneath the trees, thou canst not leave
Thy song, nor ever can those leaves be bare;
Bold lover, never, never canst thou kiss,
Though winning near the goal—yet do not grieve;
She cannot fade, though thou hast not thy bliss,
For ever wilt thou love, and she be fair!

Ah, well-a-day! if I allow the pages of "Endymion" to allure me the hours will run by and no work be done.

The vase on which the satyr is painted, with his frisky tail, is called a *Lekythos*, and was especially dedicated to funeral ceremonies holding oil or perfume; but what the satyr has to do with such, I do not know, unless it was that the entombed owner had been a jolly old fellow himself, and liked such company.

The satyrs are frequently seen playing the double flutes, and I have noticed that in most instances men players use flutes that have not more than two bulbs, whilst the flutes that have three bulbs seem to be of more delicate make and are assigned to the female players; for they, as we know, were renowned for the highest excellence in the art.

The muse Euterpe, who presided over pastoral poetry, is represented on one vase, seated and holding the pipes in her left hand resting on her knee, whilst with her right hand she encloses the upper part of one of the pipes and is pressing the tip with her thumb. It was this design that first arrested my attention. I saw that the fingers held but two of the bulbs: there was not room in the hand for more, whilst the pipe that was free had the three bulbs: hence, at that moment, one was

Euterpe preparing her Flutes

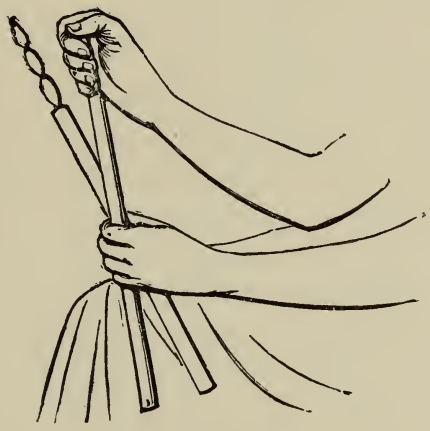


Fig. 17.

missing. What did it mean? There is no instance ever of a pipe of two and a pipe of three bulbs being *played* together as a pair.

The position of the hands of Euterpe and the method of handling the flutes are shown in Fig. 17. The painting is on a vase called a *Krater*, a vase intended for mixing the water and the wine, and its fine breadth of shape is admirably fit for the display of the paintings. There is a vase close by on which this custom of mixing the wine is depicted; the usual proportions were three

of water to two of wine, sometimes it was two of water to one of wine; whilst the drinking of wine without water was accounted vulgar,—a sign of coarseness of taste, and was in some Greek states prohibited by law.

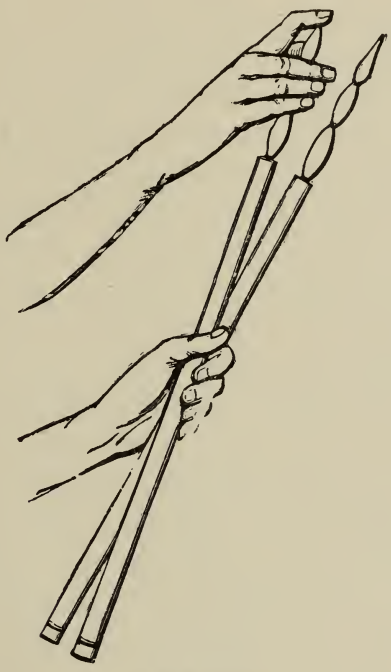
The vases called Amphoræ were for containing the measure of oil given to the victor in the Panathenæan games, and are often inscribed with the date of the contest, and name of the owner, and the words "One of the prizes from Athens." On some vases we see the player in the musical contest, standing mounted on a low stool. Erastothenes tells us that boxing to the sound of flutes was an Etrurian custom.

On a *Hydria* the scene depicted is a *Music Lesson*, and very life-like it is; there are two seated female figures, one has the two flutes with bulbs, and the other has a *Kithara* or lyre, a dog plays his part in it by listening, a panther cat is sitting on a stool, and a child free as nature leaves him is playing on the floor. It is a capital picture of Greek domestic life. Another vase presents the player on two flutes in full face, and distinctly shows that the second joint of the fingers was used to cover the holes, a custom which previously I have alluded to is thus confirmed by good evidence.

Confirming the use of four holed flutes, there is, in a case in the Greek and Roman saloon, a slab representing in relief two satyrs treading grapes in a wine press, and a youth lustily blowing the double flutes to keep them to time in their movements, and most evidently the right hand flute shows four holes, clearly and roundly cut.

Another grand vase I found. This was an *Amphora*, on which was represented a female figure, Meledosa, preparing to play on the double flute; she holds them

in her hand, as in Fig. 18, and as you will notice, with her forefinger of the right hand lightly pressing the top of the pipe, each pipe distinctly showing three bulbs; in this instance, the pipes are each completed ready for playing. Certainly we cannot regard the tips of the pipes as reeds; the shape does not correspond in outline



Meledosa's Flutes Complete.

Fig. 18.

to an *Arghool* reed, and if we imagine an oboe type of reed in use at that period, this design would not correspond, for no player would press the tip of a reed of the oboe or the bassoon kind. What, then?

My idea is that this bulb form was adopted for the sake of using a concealed reed. That the bulbs were *hollow*, I am perfectly sure; because of the witness of a

most precious fragment, preserved in a case in the Greek and Roman saloon, belonging to one of two pipes of a later date, found in a tomb near Athens. The Greeks called the double pipes *diaulos*, and these have been considered to be the representative of such; but they are not so, being distinct pipes used separately, as I shall have in another chapter to elucidate. Only about three quarters of a bulb remains, but one pipe still holds a broken portion. The length of that bulb, I should say, was originally in about the same proportion to the pipes as we see upon the vases; so that there is no doubt about the hollow bulb, as a real thing. Now, considered by itself the one bulb was a distinct invention in art, and as such it was complete in itself, yet after a time the invention was carried further, and the wonder is why? what end did it serve to introduce more?

The purpose of having two or three bulbs went beyond that of the original invention of the *subulo* pattern, and was, I imagine, an ingenious device to provide that the player should be able to transpose the reed from one bulb to the other in order to play in a different mode or key, virtually without altering the disposition of the fingers; lengthening the pipe by transferring the reed higher, or shortening the effective sounding length of the pipe by placing the reed in the next lower or in the lowest bulb of the three: thus the player would have the choice of three modes or keys, whilst his pipes would remain outwardly the same. The bulb forms an artificial mouth, as was the custom many centuries later in the *cap* of the *cromorne*. The position of the reed determines the effective length of the pipe; the difference of pitch would be in each case one tone, as I find that the length

of bulb corresponds with the distance between two finger holes of the pipe. Does this solve the mystery? Be that as it may, I have found in these vases a source of ever renewed pleasure.

> Beauty is truth, truth beauty,—that is all
> Ye know on earth, and all ye need to know.

Tombs, tombs of a dozen buried cities, once gay with life, full of the daily sympathy of pleasure, and no less of sorrow. They gave the dead their gold and silver and jewels; they gave them food, fruits, oil and wine, and left them to silence and slow time. These lovely *Amphoræ* buried, these festal *Kraters* empty,—and once brimmed with wine! We think, irresistibly drawn to think of them, with Keats's longing wish:—

> O for a draught of vintage, that hath been
> Cool'd a long age in the deep delvèd earth.

The chamber had been rifled a thousand years or more; gold and ornaments gone, only the dust and the skeletons of men and women, young men and maidens,—the most perishable of things, the vases the most enduring. The owners bought their burial land "in perpetuity;" and, like the old Egyptians, they builded for a very brief and rudely broken eternity.

CHAPTER VI.

In the Land of Greece.

FROM ETRURIA TO ATHENS.

What a merry lot those *Subulones* were, piping to song and dance and good cheer. I have been laughing over an Etruscan picture of one of these jovial fellows laying down on the grass upon his back, all the time lustily playing his pipes, and kicking his legs in the air, in sheer exuberance of merriment. And I have wondered what could that music be which so evidently was a never failing source of enjoyment to him, and to his race.

The old adage says "simple things please simple folk." Simple the music must have been, because of the very limited compass of such instruments as we see delineated; and I have thought that, maybe, the old folk songs of eastern Europe preserve to us fragments of that ancient music. Simple, indeed, but to hearers and players in those days representing the fulness of art. The suitability of such music to such instruments

is clear enough, for the tunes need but a range of a few notes, and come easily into the compass of rustic voices. Century after century these old melodies have been cherished, and seem to have perpetual life. They antedate all histories, and none can trace them to their earliest springs. How that one haunted Beethoven which he put into his Ninth Symphony, and made his chief theme,—a simple phrase of a few notes that seems as if it would go on for ever. For thirteen years it crops up here and there in his works, until at last he found full deliverance for it in the crowning effort of his genius.

In the last chapter, I showed you by illustrations the three distinct usages of the double pipes as improved by the Etruscans, and I sought to demonstrate that their new invention comprised, first, a concealed reed in a hōllow bulb ; secondly, such a disposition of the reed that one, or two, or three bulbs were allotted to each pipe, and that the purpose of such an arrangement was to obtain an adaptability in the reed, that it might be placed at pleasure in either bulb. I judged that the invention had three stages, first when there was one bulb, next when two were used, and finally three. My reasoning is confirmed by a *Kylix* in the 2nd Vase Room of the British Museum, it is of the early or archaic period (B.C. 480—440) and the pipes are with one bulb only. The player, a female player, has the left-hand pipe longest, thus evidently indicating a transition period in pipes linked to Egyptian custom.

These conditions imply corresponding advances in musical art, for by the new methods it becomes possible to play in three different modes or scales ; since if we suppose the reed to be placed in the bulb nearest the

pipe, the player would produce, as the lowest note, A; if placed in the bulb above, he could produce G; and if in the highest bulb, reach as low as F. Although his fingering would remain the same, the pitch would include a different range in each case, and, as we should say, he would thus be able to play in different keys. I reckon by the relation of the length of the bulb, which is equal to the distance between two holes, that each change would make a difference of a whole tone. The art of the player would greatly alter intervals, especially by partial covering of the holes flattening pitch to required degrees for the particular mode.

When we read of the various Greek modes—of the Dorian scale, the Phrygian, Lydian, Mixo-Lydian, Hypo-Dorian, and others—we should not forget that one was added to the other in order of time, and the full system only gradually evolved. And in this Etruscan period, the music was probably limited to the single tetrachord on three modes, and so remained for a long time. We, in some instances, see on the vases that the pipes are marked with three holes each, sometimes with four; although it is rarely that the holes are indicated at all.

The Egyptian flutes had three holes to one pipe and four to the other, which only extended the scale one note higher than the three holed. In these Etruscan flutes, however, it is by no means clear that the second flute extended the compass, for the holes seemed to occupy in each the same position as to distance. It is open to consideration that a difference in the pitch of the reed itself of one of the pipes, would possess the power of influencing that pipe to the extent of a semitone, if such entered into the design of the instrument,

and so we find a reason for the second pipe. On my models, I sometimes make a difference of a whole tone in each note of the scale produced. In default of any true knowledge of Greek practice, I think that we may fairly attribute to the artist some such design in the construction of the pipes.

It is a natural conclusion that the first invention of man in the way of flutes would be a single pipe for the production of one, two or three notes ; then with a sense of a scale the four notes. From the single pipe the double pipe would arise, with a view to some *variation* of such a scale, to which the ear was predisposed, and so the method of double pipes would be fixed by custom.

We may be quite sure that when double pipes were first adopted there was a meaning in the method. The assumption that one pipe preceded the two does not seem to hold in the case of these bulbed flutes with the four holes, they seem to start as *di-aulos*.

The Etrurian vases give no instance of single flutes. In truth, another invention was necessary, and it came in course of aftertime from the Greek mind. Like most useful inventions, it was marvellously simple—nothing other than the giving of *six holes to one pipe*, and fingering the one pipe with fingers of both hands, and with one thumb added ; even that thumb hole may rank as a distinct invention of intrinsic importance to art. A similar delay we know occurred in association with key-board instruments, and it was only in Bach's usage that the thumb was raised to the rank of efficiency and placed on an equality with the fingers.

It is remarkable that in the progress of civilization the later way of development should have been from the

double flute to the single flute, through perception of the better aid to execution and display that was afforded by the single flute, and evidently when this change came, the idea of different modes had gained acceptance, the two pipes no longer constituting a pair, but each pipe intended to be taken up in obedience to the choice or change of mode.

This is a very significant advance. Let us now study the nature of

THE SWEET MONAULOS.

The mon-aulos, "the sweet mon-aulos," not seen on the vases or wall-paintings, but known to have been, and still having a real existence in two solitary specimens now in the British Museum, and accompanied by that evidence, which is unique as it is precious, of the actual hollow bulb that tipped the pipe. The allusions I have made to these flutes in earlier chapters will be remembered, and now comes the fitting moment to enter into details. The illustrations fairly give the proportion as to distances, on a scale of one fourth, sufficiently clear to enable you to judge how the holes are arranged. The pipes are very nearly cylindrical, departing from the true figure only in being of a little larger bore at the upper end than at the lower ; which may have been done by design, or the nature of the drilling means then in use may have caused the variation of bore. If you go, to look at these relics of the Greek age, you will not see them as here represented, but curiously contorted. They were found in a tomb on the road to Eleusis, near Athens, and the damp of many centuries has twisted and warped them ; and one has been broken, snapped asunder at the middle. They are

made of sycamore, and are very plain simple instruments. What value they had we cannot in any degree estimate; but I should imagine them to be of the ordinary kind familiar to every household in which music was cherished; for the Greeks also, like the Etrurians, followed the old world custom of burying with the dead the things they had most prized in life, even as the Egyptians did.

And these flutes lay beside the youth when they left him there sorrowing, and thinking how his cherished flutes would comfort him in his loneliness. Now, not even his dust left; gone, we know not whither,—to the underworld or to the heights of Mount Olympus. We of a foreign race think of this nameless youth, because here they have brought his flutes, and these speak to us of kinship. Not without strange feelings did I handle them and place my fingers covering the holes, that all plainly showed how they had been smoothed and worn by his—*his* fingers—playing soft Lydian airs: worn fingers that one day became pale, then cold as marble, and now unsubstantial and vanished utterly; as soon, indeed, mine will be. And yet we,—shadows, both—clasp hands over this great gap of time, whilst handling things that were loved.

How I hang over that case of treasures every time that I visit the Museum; foolishly fascinated perhaps, yet irresistibly so, looking and pondering. The fragment of a bulb that is left—for a fragment it is, only about three fourths of a whole—is, by the enthusiast's valuation, beyond price. In one of the pipes, there is a piece of another bulb left sticking on the top; and, if you look closely, you will see the scored lines inside the pipe, and outside and inside the bulb, that were made

so as to ensure close fitting when the bulb was pressed in. And look again, closely, and you will see at the top of each pipe, there is a little rim edge, and then a shallow groove about half an inch broad; and this, no doubt, was bound round with fibre or ivory or metal to prevent the splitting at the top, where the bulb was pressed in and made to fit securely, being, perhaps, slightly moistened by the lips, just as we do now when putting instruments together; and the operation was frequent, since the reeds, as I have said, were taken out after playing, and placed safely away in a little box called a tongue box.

The pipes are three eights of an inch in bore, and the finger holes are oval and large, in their smaller diameter quite as large as the bore. I measured the distance between every hole, and so obtained the correct length of the instruments as in their original straight condition.

By the kindness of Mr. A. S. Murray, then the esteemed chief of the department, I was able to take every particular I wished, and to calliper the bore of each pipe. The length of the longest pipe is thirteen and a half inches, and the shorter pipe is twelve inches and a quarter, just one and a quarter inches difference, which corresponds to the distance between each hole, showing that in depth of sound the pitch of the pipes differs by one whole tone.

The details of measurement are of the greatest interest in the scientific analysis of these ancient musical instruments, and afford much valuable insight into the system upon which they were constructed in conformity with the music for which they were designed, and very evidently they tell us that the music played by the people was of a simple character and very limited in compass.

As there are five finger holes and one thumb hole to each, it is clear, on consideration, that these cannot have been di-aulos, but that they were used as single

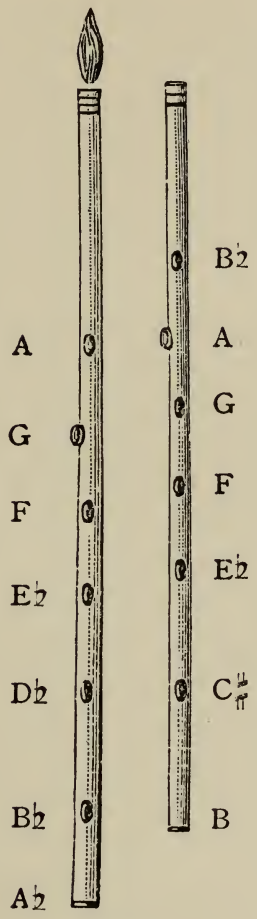


Fig. 19.

The Greek Mon-aulos Set in Two Modes.

pipes requiring two hands to play either; for the six holes would be unmanageable, and the holding altogether insecure under one hand. In my view, these are distinctly specimens of the mon-aulos, "the sweet

mon-aulos," praised by the poets; and there can be little question that the reeds used were soft and fine, and that the Greeks had acquired a skill in making them. Probably, they differed as much from the common *arghool* as the reeds used by Lazarus in his clarionet differed from those of the street player on the yellow clarionet of past days. I have given the names of the notes against the holes. The thumb holes out of line will be understood as showing what otherwise is out of sight; but it makes the series of holes clearer. In the one pipe it is the G hole, in the other it is the A.

You will notice that there is a curious interval of a minor third, which doubtless had some special importance in Greek measures. The pitch is, as we say, double pitch in respect of length of pipe, so that the low B♭ is truly the four foot note; but we speak, in general terms, of the scale given by the pipes as a two foot scale. It is a pity that, as at present disposed in the case, the pipes are unsuitably placed, being head to tail,—as annoying to look at in an instrumental regard, as to an archæologist it would be to see a statue exhibited standing on its head. But perhaps I may get this anomalous relation altered, for the observer misses the proper relation of the flutes to each other. The nature of the beating reed greatly affects the scale. That which I have recorded is given by the particular reed I have used; another reed might make one or two tones difference. Again, there is the question whether these pipes had one, or two, or three bulbs, although only one was found. I am inclined to believe that the originals had but one bulb, because the two pipes evidently indicate that one flute was used for one mode,

and the other flute for the other mode, with only the difference of a tone between them.

On the whole, I think it may be inferred that tenor A was naturally fixed upon as the starting point of the scale, which had its vocal foundation in every nation. As regards intonation, the notes specified are not exact to our tempered scale, but only as near as the actual pitch heard can be stated in our terms. In the ancient diatonic, all the tones are major tones. In the soft diatonic, an interval equal to a tone and a quarter was used, being greater than a major tone but less than a minor third. In one diatonic genus, the interval of three fourths of a tone was substituted for the second semitone in ascending. Authorities tell us that they are not aware that the Greek writers ever mention the concord of more than two sounds; any concord less than a fourth was considered dissonant, and so was the sixth. The true consonant major third was either not discovered, or not admitted to be consonant, till a very late period; Ptolemy being the earliest author who speaks of a minor third. There was a double tone nearly equal to the modern major third, and a tone and a half nearly the same as the minor third. In the later Greek periods, the system of music became intricate, and the diatonic, chromatic and enharmonic systems were in vogue, and discoursed upon to their lips' content by the scholiasts and their disciples, much the same as in modern days, beclouding knowledge.

The instruments that we have been interested in were, I should imagine, those of ordinary use in the social life of the people, associated with their ceremonies and entertainments; but the steps by which I have taken you show change in usage and aspiration in the artists.

There was even a striving after fuller command in execution, and after adaptability to the increasing range of musical theory; and evidently the stringed instruments, with their power over many modes, excited rivalry in the flutes. There is a very important and significant passage, already referred to, by an author —Athenæus, if I remember aright—that about the third century B.C. (or earlier), Pronomus the Theban invented adjustments by which the same set of pipes might be fitted to all the modes. History upon many matters we know is very elastic, and I am not quite disposed to think that the flutes depicted on our Etruscan vases answer to this description. There is yet one other possibility, beyond that Greco-Etruscan invention, in a later invention of most ingenious design, aiming at this same power of control, only that this is a single pipe, and is a development beyond those we have been considering. Very pleasant it is to trace these workings of genius

Striving, because its nature is to strive.

The next chapter affords illustrations and particulars of the new discovery; for to the Greeks it was new, and we may be sure interesting. Perhaps to some of them quite as engrossing as a new statue or the latest scandal!

CHAPTER VII.

In the Land of Greece.

THE SILKWORM FLUTES, OR BOMBYX FLUTES.

The next development of Greek ingenuity in the construction of flutes came in a remarkable guise, showing a contrast as great as our ships in mail and armour present to ships that carried our flag a century ago. Suddenly as it seems, with no transition stages, the Greek inventor brought forth his new flute of ivory encased in bronze. Evidently, it was an age of luxury. The Greeks valued in every respect each art that was known to them; they lavished wealth upon artists, and paid honours to orators and singers and players, no less than to sculptors and painters. No price was too great to pay for their beloved flutes. The flute of Ismenias, a celebrated Theban musician, cost at Corinth three talents—a sum equivalent to £581 5s. of our money. No intimation has ever been left to us of the basis upon which such valuation was made, whether an adventitious worth was given by encrustations of jewels and setting of gold, or whether some famous

maker acquired a repute so that, like Stradivarius, every instrument from his hand was sought for by those able to appreciate artistic excellence; we cannot even guess, for in acoustic conditions there is no parity of relation between fiddles and flutes; and for all that we know, the great price quoted may have been reached in fighting for a rarity, the instinct for which is perennial in the human race. So delightful a thing is it to possess that which others covet; so exalting the exultation in having that which others have not; verily, it is the taproot of all civilisation. Without it civilisation had never been.

The particular flutes now under examination must have been costly, but only moderately so. The Greeks were adepts in metal work of all kind, and in these flutes their skill in the art is manifest; battered as they are and grey green with age, they bear the record of the master hand. The interior tube is of ivory, and the outer or encasing cylinder is of bronze. At the upper end there is a raised piece of metal, in the curve of which there is a figure of a reclining Mænad, still beautiful in figure, and in flowing lines of drapery. The flutes are the counterparts of each other, differing only in length, and slightly varying in the distance of the finger holes. The lengths are respectively eleven and a half inches and ten and a quarter inches; but the last named pipe has the end fractured, and, therefore, may have been as long as the first, or longer. The measurements may not be exact, but are approximately as stated; at all events, sufficiently so for the needs of our present purpose. It should be understood that the fragments are pieced together, and with even the most careful handling one would fear disaster.

The two instruments bear a relation to each very similar to that of the two sycamore flutes illustrated and described in the last chapter, and evidently also the player chose one or the other according to the mode in which he intended to play, or, as we should say, the key in which the music lay; here, however, in these segmented flute pipes the method is not the same, the particular mode depends upon the section arrangements being fixed, and laid out for a succession of intervals quite distinct for each pipe.

From the mouthpiece to the lower end the length is the same in each pipe, but the intervals that could be used in playing are not alike. Measure off the sections as in one pipe and it will be seen that no corresponding distances are found on the other; notice how differently the segments that are longest, representing a tone and a quarter or a tone and a half, come in each particular arrangement. The elevated plateau at the upper end is about three quarters of an inch in height, and the table-land at the top is about a quarter of an inch square, there being a little circular shaft drilled through the metal, leading into the body of the flute. This is to all appearance the mouthpiece, and, without questioning, I had formerly accepted the general notion that here we had specimens of the lip blown flute. The little aperture nearly a quarter inch in diameter would undoubtedly serve for blowing across, with the lip resting against the block. When, however, I came to examine these treasures of a lost art, with a view to understanding them, misgivings arose; for how could the scale be constructed, seeing that, in a lip blown cylindrical flute, the octave note would occur at the half of the length? At the fourth hole distant from

the bottom opening, the note given would be the octave. No, this could not be. Moreover, the lay of the finger holes is so like that of the sycamore flute that one sees directly the correspondence, and is driven to the conclusion that we have here higher developed specimens of the reed blown aulos.

The Silkworm Flutes.

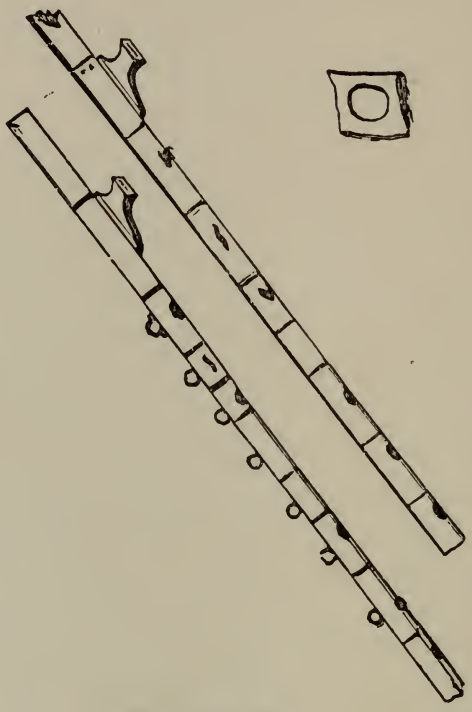


Fig. 20.

Why have I named this the silkworm flute? Because the resemblance suggests itself. You will notice that the cylinder is segmented, as a caterpillar looks to be; and we know that the Greeks had a flute so peculiar that it was given the name of *Bombyx*, which is the name by which the silkworm caterpillar is known in science.

Each section had a small loop or ring of metal, by which, being pressed against, the section was made to revolve, or to be partly turned round to cover or uncover the finger hole, so that the player threw out of gear, as it were, any hole not required in the mode he was playing in. When all the little loops are brought into line along the bottom of the flute, they look like caterpillars' feet. Although I venture to speak of this as the *Bombyx* flute, I am aware that there are passages in ancient authors which may seem to claim the appellation for some other kind; but various statements so mystify us by their incongruity that we have to withhold belief, and to question how far the author was practically acquainted with the craft of the flute maker, and how far he may not have written from mere hearsay, not himself clearly comprehending all that was signified by the terms employed nor the various usages they might include. It is so in our own day, particularly in the matter of musical instruments. An instance in point occurs in the very case containing these flutes, for there is here another antique specimen (in kind quite distinct from these), which was found by Sir Charles T. Newton (our foremost authority on classical treasures), and he describes this as "a flageolet (*plagiaulos*) in bone and bronze, with mouthpiece still entire," found in a tomb at Halikarnassos. Here are two questionable assertions. First, it certainly is not a flageolet, for flageolets have whistle mouths; second, it may or it may not, be the true representative instrument understood by the ancients as the *plagiaulos*. We are led to suppose that the meaning of the term is a side blown flute; but, for aught I know, the silkworm flute may be a true *plagiaulos;* for, obviously, from a prac-

tical point of view, this flute was held sideways, though blown with a reed, as will presently be explained. A flageolet is not a side blown flute ; but what Sir C. T. Newton discovered is a most ancient example of a transverse flute—that is to say, blown in the same way as our orchestral flute, and held in the same position, and so is side blown. What I should be inclined to contend for, is that we have in *reed* flutes the *di-aulos*, the *mon-aulos*, and the *plagi-aulos*, and that they originated in the order here shown.

The Flageolet Proper

Fig 21.

Frequently small flutes are called flageolets by writers of the present day, but the true flageolet should have a bulb head. Its invention is ascribed to Juvigny, about 1581. The old French name is "*flagol*," the German "*flaschinet*." The name flageolet should properly be confined to those flutes or whistle pipes having a flask-like head or mouth-piece with a conducting neck—that is, a small tube inserted into a hollow bulb (hence the derivation of the name, from the same root from which "flagon" comes), and within the bulb a small piece of sponge inserted to collect and condense the moisture from the breath.

Adrian, junior, quotes Aristotle on the *Bombyx* flutes as to the length of the pipe, and says that "they were blown only with great exertion." That they were difficult to perform upon, we may well believe; and we know that in our own clarionets the low notes require strength of wind more than the upper notes do; but the recorder or the translator may be responsible for the implication of great exertion. The longest flutes that have as yet been discovered are of the kind now under examination, and so far confirmatory of the right to the title that I have given them; and one of four (described in the next chapter) discovered at Pompeii, now in the museum at Naples, exceeds twenty inches in length, and in the copy of it made by Mr. Victor Mahillon the loops, being complete in their series, have strangely like appearance to caterpillars' feet. I should not omit to remark that in our specimens, only traces exist here and there of such loops at points where they were soldered on; but, for verisimilitude, I have indicated the series on one of the pipes. At the second segment on the upper pipe marked with a short line —, the evidence is quite plain.

Whether the interior tube is of ivory, bone, or wood, the condition is such that the eye cannot judge; but in the Naples instrument I believe that, without doubt, it was ivory, and the bore three eighths of an inch, as it seems to be in this case. The great advantage of ivory is obvious, because the cylinder necessarily fits close, and any swelling of the inner tube from moisture was a liability to be avoided.

I have illustrated the square at the top of the mouthpiece, and shown the hole which is perforated in it and leads down to the body of the flute; and, looking at

the diameter of the perforation—barely more than one eighth—the unsuitability of such for office of a lip blown flute, with its bore three times the size, is strikingly obvious.

Here is another instance of the little reliance that can be placed upon authority when it goes beyond its own particular line. In this display which is the greater, its ignorance of the nature and structure of musical instruments, or its scholastic jumble of science? This passage I find in "The Life of the Greeks and Romans, by E. Guhl and W. Koner, translated by Francis Hueffer." "The aulos proper resembles our hautboy and clarinet, differing, however, from the latter in the fact of its lower notes being more important than the higher ones. The aulos consisted of two connected tubes and a mouthpiece, to the latter of which belonged two so-called tongues, in order to increase the trembling motion of the air"; and of the capistrum or head straps, "the purpose of this bandage was to soften the tone by preventing violent breathing." For connected errors of statement of fact, and audacity of ignorance in drawing inferences, these authorities would be hard to beat. If one thing is more certain than another on the authority of the Etruscan vases, it is that the pipes were not in any way connected; and in a stone head found by Cesnola, at Salamis, the strap passing round the cheeks is carved, and shows over the mouth two separate apertures for the pipes. This, already referred to, is absolutely conclusive.

In the illustration, the raised mouthpiece merely appears to be nearer the top end in one pipe than in the other; for you should notice that in the upper one the end is jagged, and I have no doubt that originally both

pipes were as the lower one, in which the end is completely closed. But whether interiorily the end was blocked near where the slant perforation entered the body of the pipe, I cannot see ; I should say that it was, because we find it so customarily in flutes of other nations, both in modern and ancient usage. Here you will see that the distance from the end to the mouthpiece is quite two inches, and that end of the bronze cylinder was, I should think, a fixture ; because I perceive that the mouthpiece itself is fitted upon a movable segment. Very curious that is, and no doubt had its purpose. Perhaps the design admits of the partial turning round of the segment of bronze to obtain a different angle of mouthpiece to the fancy of the player.

Then notice, further, that the top finger hole is but a short distance from the mouthpiece ; and, according to all experience with such pipes reed blown, I judge that, as that hole gives the octave note to the lower open end, some additional upper length is in demand, perhaps four inches or more. So if the distance is reckoned from that hole to the top of the table of mouthpiece as two inches, we require the reed and its fittings to occupy a further extent of from two to three inches. The diameter of the hole bored through the block, being but little more than an eighth and a sixteenth, shows that reeds must have been used.

I consider that the stem of the reed was so adjusted and fitted in this hole that for playing the pipe a length suitable was obtained ; and the reed may or may not have been enclosed in a bulb. I have hitherto spoken of the form as resembling a bulb, but to the Greeks it may have suggested a likeness to the silkworm cocoon, and so there was a double association of

thoughts, and both these and the Etruscan flutes may have had the name *Bombyx* applied to them. We know in our own times how very diverse varieties of things rejoice in similarity in name, and trouble us by being presented under more names than one, as fashion, fancy, or locality determines.

Having described these ancient relics as regards their structure, the chief interest remains. Do we understand them as the Greeks understood them? I confess that they perplexed me for a long time. Often I looked at them, asking myself Why did they make them thus? What purpose had they? What motive? What advantage to gain beyond those sycamore flutes? I could not be content to regard them as curiosities only. I wanted to get at the root of the matter,—the because: the cause of being. I hung over these flutes, trying to drag the mystery out of them; and, after a time, being in the mood, the guidance came, and I went contentedly to sleep.

Before giving my solution of the problem it is necessary to make a few comments upon the Greek scales. If you would think as a Greek thought, you should dismiss from your mind all reference to our system of harmony, our key-note, foundation of the scale, or our division of the octave. For the points to which I have to call your attention, it seems desirable that you should now for comparison with the bronze flutes, refer to the illustration in the last chapter, of the sycamore flutes. Whatever the elaboration of the theory of music from Pythagoras to Ptolemy, the musical instruments of the period, so far as we have evidence in representations or in relics, do not assure us of the influence of theory to all pervading extent, in the ordin-

ary practice of music. Certain rules which had grown up in the schools were necessarily adhered to, because accepted by the popular taste; or, rather, we may regard such general rules as the exposition of traditional measures, and methods of inflection and cadence, consecrated by usage. The demonstrations of the mathematics of music by the monochord was a fascinating pursuit of the philosopher; yet the value must have been more intellectual than practical.

In the Greek scales, the chief strangeness to us is that the keynote lays not at the beginning, but within the scale; and it was called the *mese*, or middle note. Nevertheless, its position was not always in the middle, but was shifted higher or lower in the octave according to the mode for the time employed. The scale originated in the tetrachord, and the octave resulted from the combination of two tetrachords; in the old system these were conjunct, and in the new system disjunct, and the two systems were exemplified in the octave lyre. The primary rule in the disjunct system was that the separation between the two tetrachords should consist of a whole major tone. Another rule insisted upon by every Greek writer was that there should be an interval of a whole tone, at least, immediately below the *mese* note; and, as Aristotle says, "*Mese* is the leader and sole ruler of the scale."

I make no pretence of discoursing upon the Greek musical systems; all I desire is to fix your attention upon certain peculiar features unfamiliar to us, but upon which the *structure of the flutes* depended. I have previously alluded to the special importance of a curious interval of a minimum minor third, and maximum minor third, in the Greek measures, not our intervals.

The historic record, together with an exposition of the growth of these scales, and their bearing upon the development of the system of music, will be given in a later chapter.

Now look back at our mon-aulos; it has six holes, and is governed by the fingers of two hands, with the thumb added, and this is the first instance of the thumb being employed in flute playing. Now look at our *Bombyx-plagiaulos* (if such name be accepted), it has the same number of holes, and the thumb hole lying underneath between the upper two holes. One can understand how in the longer *Bombyciæ* (of which I shall have to discourse in the next chapter) there was an obvious advantage in having movable sections of a cylinder to shut off notes, simply for the reason that the fingers could not manipulate thirteen open holes. But the puzzle with the shorter *Bombyx* is that it shows no advance beyond the mon-aulos in the demand made upon the fingers, which could cover the holes as required, without any need to have particular holes shut off mechanically. I could not comprehend, and the question persistently arose, what was the utility of the new invention? Look at the relative positions of the two lowest holes of the mon-aulos; in each instrument the peculiarity of relation is noticeable, and yet there is a difference in each. Why? The conclusion I arrive at is that there is something traditionally imperative as to the unequal division of one tetrachord in the octave; that originally it was the lower tetrachord that was thus subject to custom; that afterwards more licence was taken, and, still subject to rule, there was choice as to where that tetrachord might be; and I find in the mechanism of the *Bombyx*

a provision for the varied placings of this unequally divided interval. Here we see the meaning of the rule that the soft diatonic used an interval of a tone and a quarter, greater than a major tone and less than a minor third. In all these four instruments you will notice how one fourth is divided with a large interval in the upper section in one of each pair of instruments, and a short interval in the other, thus reversing the upper relation: and as regards the *Bombyx* flutes, there is a similar reversal of the distances between the three lowest holes from the bottom.

In the sycamore flutes, the fourth divided into two intervals occurs at the bottom from A♭ to D♭ in one, and alike in the other from B♭ to E♭. All other distances between holes are regular, so that this is the only position for the particular effect of only one intervening note. But in the silkworm flutes, there is the possibility of placing that special fourth in various positions of the range of holes, by covering the hole which exists, but is not wanted; not only that, but by rule excluded from the accident of use. Here, in both cases, the third hole from the bottom makes with the thumb hole the interval of a fourth, and with the top hole the interval of a fifth. At a guess, I should read the scale of the flute placed highest

A♯ B C♯ D♯⁀F♯ G♯ A♯

We really have no notation to express the actual relations of intervals, which exceed or are short of ours. Remember that the Greeks had three-quarter tones, one-and-a-quarter tones, and one-and-three-quarter tones; and combined these so as to make larger intervals, curiously varying, as you may judge by the eye.

D♯ otherwise E♭ I reckon to be the keynote. The mouthpiece I named as probably arranged to shift in position and lean towards the player, so as not to be exactly in line with the finger holes, and if the hole in the ivory tube was made larger than the hole entering from the mouthpiece, that convenience would easily be obtained. I should imagine that the transverse flute was in vogue at the time, and that this invention was designed to afford the *reed flute* performer the facility to assume an attitude, which, maybe, was preferred by people of fashion.

The remarkable specimen of a *transverse* flute, found by Sir C. T. Newton, noticed at page 97, I give a description of in the final chapter, "How the Music grew."

The high significance of these ringed flutes is that we have them as they were left by the hands that used them, arranged according to traditional observance of rules proper to the national melodies in which the people delighted. It is a record that tells us more than books or treatises teach us.

An accomplished Greek gentleman played to me today some of the music preserved in the ceremonials of the Greek church; believed to be the most ancient known, and still heard in wild melodies of the mountaineers. On the pianoforte it cannot be truly rendered; yet the character is ineffaceable, the music is indeed beautiful. It seems as it would never come to a close, —only pause in a divine expectancy.

CHAPTER VIII.

In Oscan Land.—Italia.

FOUND AT POMPEII.

THE GRECO-ROMAN FLUTES.

Four flutes were found at Pompeii, and they were all of one pattern, of greater length, yet following the same system as in that latest Greek invention illustrated and described in the last chapter, and indeed may be considered as the final development attained by the Greeks in instruments of the flute kind, for nothing has to this day been discovered in advanced superiority to it for musical capability or for display of refined workmanship and technical ingenuity.

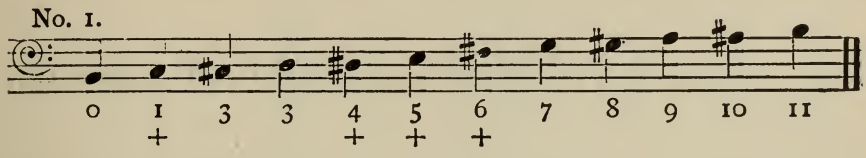
These instruments, are, it is true, classed as Greco-Roman, but they are essentially Greek, although of the period of the Roman dominion. The body of the flute is ivory, and it is twenty-one inches long, bored throughout in perfect cylindrical bore three-eighths of

an inch diameter. Think of the skill necessary to accomplish this with most primitive tools! Then the ivory is surrounded by a closely fitting series of cylinders of bronze and silver alternately in sections, and each section possesses just sufficient ease of fitting that it may be caused to rotate on the ivory by simple pressure of the finger upon a little metal loop which had been provided for that purpose. The end sections are fixed to the ivory tube, and thus hold the others in their positions. The appearance of the instrument is most attractive—bands of olive-coloured bronze, with bands of silver intervening. The finger holes, to the number of eleven, are bored in the ivory at the proper distances, and corresponding holes are made in the bronze tube. When these holes in the ivory and in the bronze are set in line and correspond, then the note can be sounded proper to each opening as related to the sounding lengths of the tube; but the player, by turning any selected bronze section to the right or left, can close the finger hole so that the note is left out of the scale. It is a charmingly simple device, and yet how many ages had to pass before human intelligence contrived it, and nations of men had passed likewise—gone back into the dust that they rose out of.

This city of Pompeii still speaks to us. Its message is of dust and ashes, very human in its meaning. From the ashes came this silent record of a dead music. There was a day of garlands and of feasting; young men and women joining in dance and song, and listening to this flute piping its well-loved melodies; and the flute was laid down, warm with the fingers of the player resting awhile from mirth inviting music, and then—after a long while—it is found just as it was left that day,

with the four notes closed off, which the player wanted not, in the scale of the mode chosen for that last melody breathed from this flute by living breath.

This was the series of notes which the flute was capable of giving, and the closed-off notes are, as will be seen, each marked with a cross, Nos. 1, 4, 5, 6 :

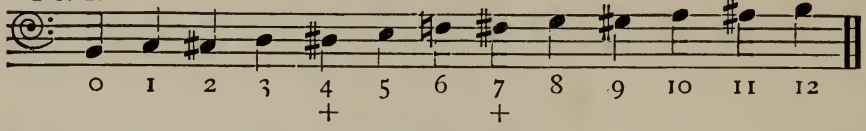


The depth of pitch may seem cause for surprise when we remember that our flutes of the present day that are nearest in length of tube to this Greek instrument do not reach by an octave this extreme low compass. The difference arises through the means of excitation for producing sound from a *cylindrical* pipe ; this therefore is a reed blown, not a lip blown, flute, and properly belongs to the clarionet species. In pitch, it descends lower than our A clarionet, and we have to modify the conclusion generally held that the Greeks only used instruments of high range of tones.

Now, taking up the remaining three of these four flutes which were found together in one mansion, on which was written the name, "Caio Vibio" (as was seen on the day of their discovery, December 10th, 1867), we notice that they also had their lowest note B in the 8-foot octave. The reeds were placed at the top of the instruments, not branching out aslant as indicated in the specimens illustrated, earlier, (page 96), of this particular construction ; and the instrument was held in position like our clarionet, only lifted more to the horizontal probably, for on this point we have not,

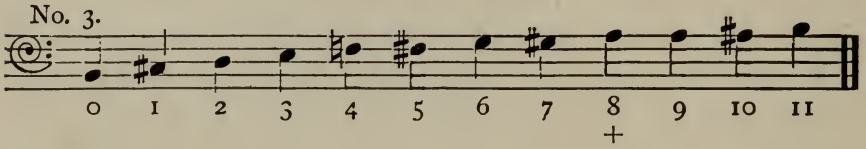
that I am aware of, any ancient representation. No. 2 has twelve notes, there being one note interposed which is not found in No. 1. It is F♮; but the extent of compass is the same, whilst the closed holes are 4 and 7:—

No. 2.



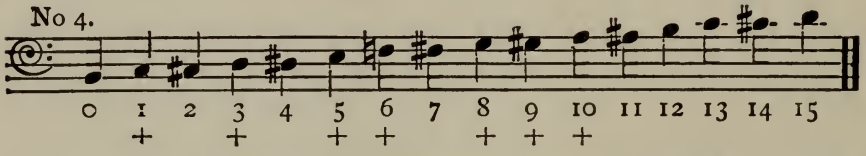
In No. 3 we find other differences, and this peculiarity, that the second and fifth sections are not pierced with holes, so that practically the corresponding notes were permanently closed—there is no note between B and C♯, no note between D and E. Observe that the first note in each is marked (o), for this is the note from the open end of the pipe when all finger holes are closed:—

No. 3.



In No. 4 we find other distinctions and an extended range:—

No 4.



I have had further correspondence with M. Mahillon, and he out of his abundant courtesy has added to my obligations to him, by sending to me his two large photographs of the Pompeian flutes, taken as they are in the Naples Museum; and I have had these photographed in reduced size, and engraved. They show the closure rings in the position in which they were

The Pompeian Flute.

1. Front View.

2. Back View

Fig. 22.

found (refer to final chapter for clearer outline drawings). The large expanded portion at the top of the

pipe is made of ivory, and is cup shaped, and into this the reed was fitted for playing. Whatever the original reeds were, they perished in the heat of the lava and ashes that overwhelmed the city. The cup would have suitably held either *Arghool* reeds, or bulbed reeds, enclosing these or other kinds of reeds. When M. Mahillon first investigated these flutes, he supposed that the *Arghool* reed had been used by the players in their day; but he now tells me that, having in more recent years made the acquaintance of most of the pipes of the middle ages—the cromornes, the courtauds, the dolziana, racket and others—he has come to the conclusion that the Pompeian flutes were blown by some sort of *double* reed, but differing from the oboe and bassoon type, which are adapted on a short metallic tube of small bore; and he considers that probably they were of the sort now existing in the Japanese pipe called the *Hichirichi*, but I do not see how this could be, since such have a broad base, quite half an inch in diameter, to fit into a tube corresponding. Moreover this explanation or supposition leaves the chief part of the problem unanswered—what then was the utility and purpose of the three bulbs? The mystery is there still. Perchance the meaning of it is this—the era of the concealed reed has closed, and this Pompeian instrument announces a new departure in flutes, played by a broad double reed sensitive to a *ligature* pressed by the lips, the precursor therefore of all modern reeds that can be accommodated to pitch.

I have myself one of these interesting little Japanese instruments, and will in another chapter describe and illustrate it; and the curious thing about it is that, in the splendid work on Egypt got up by order of the great

Napoleon, such an instrument is figured there complete in every detail of pipe and reed, full size, and is claimed as an instrument belonging to Egypt. Did Japan get it from that motherland? The plot seems to thicken.

You will notice a curious application of the closure in this last specimen, No. 4, there being no fewer than seven holes shut off from speaking, sections 1, 3, 5, 6, 8, 9, 10; and we cannot well understand or suppose it likely that during the progress of the piece of music the setting of the rings was changed. The player on this was able to supply three notes beyond the compass of the other flutes.

In reference to specimen No. 3, there is one particular which we should not omit to refer to. The ring closing the *a* (section 8), has a second hole bored at a little distance lower, and so gives a note flatter than that which the chief opening emits. In fact, we have a second $g\sharp$, which is a little higher, and establishes two quarters of a tone between *g* and *a*, and the *g* itself it is remarked is too low by a quarter of a tone. The various skips fixed by the closed holes cannot be without meaning. In one instance, we find a skip of a fourth; and the minor or neuter third, which I remarked upon as common to the earlier flutes as a fixed interval, and for some reason or other preserved, is also exemplified; in No. 4, we have $D\sharp$ to $F\sharp$, and again all sounds closed for the fourth between $F\sharp$ and $A\sharp$; and in No. 1, all sounds closed between D and G.

One wonders whether we have not some reminiscence of an earlier pentatonic scale in these, some traits by inheritance and tradition. Travellers in Persia have remarked that the singers seem to have a custom of making a drop of a fourth in the two concluding notes of their song; and the people in that land of the rose

and the bulbul are passionately fond of song, and gather together, sitting out half the night in the open air, listening to song following song. All national traits are worth studying, and very often simple things render true clear light to the investigator.

All the details respecting the construction, the scales, and the conditions of these Pompeian flutes, we owe to M. Charles Victor Mahillon, who, travelling with M. Gevaert, the Director of the Conservatoire of Music at Brussels, found these unheeded relics of the musical art in a corner at the Naples Museum; and, fired with enthusiasm, was able, by his recognized position, to obtain the necessary permission to fulfil his desire, which was to make copies of them for a full investigation of their musical nature. He made most exact copies, down to the minutest details, and so enriched the museum which has long been under his fostering care, and increased the world's knowledge because enthusiasm was allied to practical skill.

As Nature goes on in the same old way, never changing her laws or her behaviour, we can hear from these models the same tones as were heard by the Greeks, centuries ago; the flutes are faithful even to the pitch, for a pipe preserves its interior diameter, and is a true record which age does not imperil. In this respect, the wind instruments have the advantage over the stringed kind. The shapes of the Greek lyres we know from the vases, and from the paintings and sculpture; but of the nature of the strings and their tension, and the amount of sound elicited from the sounding-board, we remain in ignorance, and our best surmises fail to explain or account for the effects attributed to the skill of the players on these instruments.

Whether by some peculiar skill the flute players were able to produce a series of harmonics, is a puzzling problem. There is no reason to suppose that they could control the reed, unless they used a reed with reversed cut of tongue, like that of the old Chalumeau, or some other kind of reed, or a double reed as just now suggested ; not the *Arghool* reed. To obtain harmonics merely by hard blowing would be a hazardous affair, especially in public performance before an audience professedly merciless to failure. The only harmonics to instruments of this class are twelfths and possibly fifths. Yet on the other hand, in the contests between ancient flute players, the especial aim of the rivals was to outdo each other in producing the highest notes.

Our players on oboi and clarionets only obtain harmonics with certainty by pressing the reed with the lip, so as to shorten the reed's active portion. On the Egyptian flutes, as stated in a previous chapter, fifths were obtained in series, and after that octaves. A fine straw reed tongue was used in this case, and may account for results so different from modern custom.

One of these four Pompeian flutes produces three notes beyond the compass of the others, and there was doubtless some intent in the distinction ; possibly the player who handled it had the dignity of first flautist.

There is yet one other example in existence of this type of flute. It was discovered at Salamis, in the the island of Cyprus, by Cesnola, and is, I believe, included in that portion of his wonderful collection which was sent to New York. It is described in his book, "Salaminia," and is illustrated. Although in decayed condition, its structure is apparent. It is of bronze, with sliding cylinders ; is about twenty inches long,

and is perforated with fourteen finger holes, three of which it would seem were closed off. Careful measurements were taken, and an exact copy made by Messrs. Carte, and they were thus able to ascertain the original notes of the time worn instrument. The notes are nearly those of the modern chromatic scale, the lowest note being C in the bass clef, and the highest G (an octave and a fifth above). These notes,

C, C♯, C, D♯, E, F, G, A, B♭, C, E, G,

were obtained by using an *Arghool* reed, and—as they vary from the scale obtained by M. Mahillon, on the Pompeian flutes—there is some reason to infer that a stiffer reed was used, as anyone who has had experience with these reeds knows how greatly pitch may differ on the same pipe when two different reeds are tried; in fact, resultant pitch is the effect of the combination of pitch of reed with pitch of tube. Both F♯ and G♯ are missing from this Cyprus specimen. The age of this flute is not indicated; but the Pompeian flutes are fixed to a year, almost to a day, in the memorable year 79 of our era, when the gay city was overwhelmed in the lava of Vesuvius. Thus we may say that these flutes have been held in safe keeping through that stretch of years between our own time and the destruction of Jerusalem by Titus, an association of thoughts which will come home to many readers more clearly.

Pompeii was originally founded by the Oscan people, who had nothing in common with the Romans, and did not lose their independence until about 90 B.C. The city was the last in the Campania, which was reduced to submission by the army of Rome.

These long Pompeian flutes could not have been played with all the holes uncovered; indeed, I come to the conclusion that one instrument in its purpose had the same utility as our three clarionets, enabling the player to take the scale in a lower range. Thus, at one time he would limit himself to the upper portion, and not use the lower; and at another time close off the upper notes and extend the range to the lowest extreme. And such changes might have been made at the end of any part of the song, or measure of the music; and the rearrangement in the closing of the holes would easily and quickly be effected. We should not, I think, imagine that an extensive compass was desired, as we desire it; for art was limited by precise rules and elaborate systems, and to ignore them was to offend. Evidently, in this instrument the capabilities of the Greek and Roman *Auloi* attained perfection,—nothing further was achieved; and with this we may consider that the era of ancient flautists closed.

At the present time there are several bands of excavators at work on classical sites. There is rivalry between the savants of four nations (German and French, English and American), each anxious to unearth the past, so that any day we may see new treasures that for centuries have been waiting,

"Hid from the world in the low delvèd tomb."

CHAPTER IX.

Back to the Land of the Nile.

EGYPT REVEALS THE SECRET.

What! didn't you know? I thought that everybody knew that. Why not have asked before? Could have told you at any time. That is the way that secrets have of coming out,—"promiskuss like," as they say in the village. Now it seems that the bulbed mystery that we have been tantalized about, and which has so worried the lobes of our brain on sleepless nights, is after all a piece of nature, coaxed by artifice to be non-natural. A method of waist making was practised in early life to ensure the result desired; it was an instance not of design in nature, but of design upon nature, much as the modern young lady's waist is. The simplicity of the explanation is charming. There is a passage in Pliny referred to by Mr. W. Chappell in his History of Music, and I will quote what he says. What it means I do not know, but that is by no means an objection, as one mystery is at least left, and what

we shall do when every secret is open is a mystery past finding out!

Pliny, in describing the reeds grown in Lake Orchomenus, in Bœotia, says that one which was pervious throughout was called the piper's reed (*Auleticon*). This reed, says he, used to take nine years to grow, as it was for that period the waters of the lake were continually on the increase. If the flood lasted at the full for a year the reeds were cut for double pipes (*Zeugitæ*), and if the waters subsided sooner, the reeds were not so fine, were called *Bombyciæ*, and were used for single pipes.

There is another account of this furnished by the ever learned Mr. J. F. Rowbotham, in his so styled "History of Music," which is no history, but a monologue (attractive, truly) on the historical progress of the art of music during some centuries. He says that the whole account is in Theophrastus (Hist. Plant, IV., 11), and names the lake differently. The passage runs thus:—

But most of all was Antigenedes renowned for the care he took in choosing his flutes. And we hear that he altered the time of cutting the reeds from September to July or June. For the reeds of which the flutes were made grew in the Lake Copais, in Bœotia, which also furnished Pindar and the Theban flute players with flutes. And this is the way that the reeds were cut. The flute reed always grew when the lake was full with a flood, which took place about once in every nine or ten years. Its time of growing was when, after a rainy season, the water had kept in the lake two years or more,—and the longer the better. And it was a stout, puffy reed, fuller and more fleshy and softer in appearance than other reeds. And when the lake was swollen, the reeds increased in length. And the time of cutting was in the rainy season in September. And this was the time of cutting, up to Antigenedes' time. And he changed the time of cutting to June or July,—*i.e.*, in the heat of summer. And the pipes cut at this period, they say, became seasoned much sooner; three years were sufficient to season these, whilst the others cut in the rainy season took many years to season. This is what they tell us. But I think that it was another reason which induced him to cut them in the dry season.

And that was to get the reeds crisper and shorter and smaller in the bore, and that for this he was ready to sacrifice even beauty of tone to get them crisp and small. It was at any rate to get some peculiar and highly artificial effect.

Doubtless, the original readers understood the author, and filled in implied details which we are in the dark about. The ancient writers avoid telling us what we want most to know. It is, for instance, at times, doubtful whether the name *reed* always refers to the body of the pipe, or at times to the vibrating reed, and a writer or translator would easily fall into error if without practical knowledge of wind instruments, just as they do in similar matters of musical detail at the present time. Some ancient writers, we know, wrote only from reports on the subject of music, being themselves ignorant upon it, although they are in several instances our chief authorities for the learning of the ancients thereon.

To the description given by Mr. W. Chappell, he adds his own comment: "these reeds throw out shoots around them, and perhaps each row of shoots may have been counted as a year's growth." I am not so sure that a reed "pervious throughout" would throw off shoots; some such are merely sheathed like bulrushes and flags. The contention of Mr. Rowbotham that Antigenedes "must needs change the time of cutting flute reeds, in order to get crisp reeds, and reeds with small bores, and that they might give out these (*Hemiolian Chromatic*) querulous intervals" is not convincing, and the use of the word "querulous" betrays that he is "begging the question"; indeed, his point is that "the age was an age of quibbling and cavilling and hair splitting, and these subtleties of thought had their

parallel or consequence in other things as well,"—including querulous flutes. This imagined correspondence between things and thoughts shews the writer to be clever as a special pleader, but that he is a specialist in wind instruments does not follow. The question is still open, did Theophrastus speak of flute reeds or of flute pipes, or of the reeds to be used for bulbs, or of those for making reed tongues?

Antigenedes wrote about the year 450 B.C., it is said, that he increased the number of holes of the flute. It is a curious coincidence that Ling Lun the Chinese minister of Huang-Ti, was also sent to a *chosen spot*, called Tahsia (since identified as Bactria, the mother of cities from its unrivalled antiquity) west of the Kuenlun mountains, where there is a valley called Chichku where bamboos of regular thickness grew, that he might there choose the finest sort for music, and thus set out the true *lus* or laws and principles. How strangely the Greeks and Chinese tales agree, that the pipes must be very choice, and of a particular growth.

Some years back, when I first entertained the idea that these bulbs figuring on the vases represented real hollow bulbs, I sought high and low for evidence of any species of reed growing with such distinct shape that it could be so employed. I made enquires of curators at South Kensington botanical departments, and also at Kew, but without success, and no botanist could afford me the information that I was anxious for. There was no reed, neither roots of reeds, anywhere answering the description.

Yet such reeds grew! It is because the nature of the growth of the reed has assumed a most interesting importance at the present stage of our investigations,

that I have introduced these quotations from the ancient writers.

A very valuable piece of information has recently been obtained from Egypt, and we owe our knowledge of it to Mr. T. L. Southgate who read a paper at a Musical Association meeting, upon the pair of Egyptian flutes found and shown by Mr. Petrie. He had obtained tidings and measurements of similar pipes in foreign museums, and gave particulars of experiments as to pitch, and showed a model made according to details communicated to him by M. Maspero of a so-called flageolet with eleven holes, found in ancient Panopolis anterior to the eighteenth dynasty, 1500 B.C. This extraordinary find he stated, was furnished with a moveable beak of the whistle kind, and it gave a scale of semitones and two enharmonic intervals; and the scale, he maintained, corresponded almost exactly with our present chromatic scale. Thus the musical acquirement of the Egyptians was raised to a most exalted level, much beyond anything ascribed to that people, and some head-shakings and symptoms of unbelief became manifest among the curious musicians assembled. I confess that I was among the doubters. Neither the flageolet nor the scale seemed to me to conform to the genius of the people, as shown in their tablets of stone, or papyrus rolls, or wall paintings. The date 1500 B.C.—four hundred years older than the Lady Maket flutes—was understood to be fixed by M. Maspero, and confirmed by other recognised Egyptologists, and the genuineness of the relic seemed vouched for.

And now comes the strange part of the discovery. It was found that the supposed flageolet beak was no flageolet affair at all, neither in form nor purpose, and

that what had been interpreted in the drawing as a whistle mouth was the representation merely of a patch of pitch or bitumen that had in ancient days got attached to the original. About as dumbfounding an experience as that which befel the renowned Mr. Pickwick at the deciphering of the ever memorable Roman inscription. We may now sing old Hummel's chorus :—

> " Light, light in darkness,
> The daylight dawns; "

for the mistake brought out the secret, and the information long wanted was to be had for the asking, and came out in a very matter of fact way. M. Maspero says that the head piece found with the pipe was a hollow piece of reed, bulb shaped, and that it was a custom to grow such bulbs by subjecting the reed during its early growth to artificial constraint. Places in the reed would be chosen, round which, when it was about half an inch in diameter, a string or other fibre would be wound closely, and the reed so treated left otherwise to grow to its proper growth of about exteriorly three quarters of an inch. The artificial waist therefore remained with, say, a quarter inch interior diameter, whilst the other portion expanded in growth as usual, and thus these mysterious bulbs were formed. The explanation is delightfully simple, and the wonder is that no one thought of it before, for I expect that there are similar practices of reed torture going on in other parts of the world, which probably even our botanists could have made us acquainted with.

The difficulties of obtaining knowledge from those who know is, however, a common experience; not that knowledge is refused or withheld, but that the specialist and

the neophyte seem unable to get into the same line of sight, and between the two there is often a great lack of perceptivity of the actual kind of help wanted, and the language of reply only perhaps may serve to show us what dumb creatures we are in our endeavours to understand one another.

The eleven holed pipe was found in 1888. As M. Maspero has no doubt about the age of this flute, and maintains that it dates back to the eighteenth dynasty, and as he is in the front rank of authority as an Egyptologist, we have to accept his decision, although it throws previous conclusions into confusion.

The Chinese are held to have possessed an octave scale of twelve semitones more than four thousand years ago, but heretofore we had no hint of an early existence of such amongst the Egyptians, nor of an intercourse with China which would account for identity. It is altogether mysterious, and raises new questions of affinities, and of the evolution of mind in the human race.

So far the details afforded give a new insight into the nature of the bulbed flute, they tend to support my idea of the use of the bulb for holding a concealed reed.

As it is, Egypt has revealed one secret concerning the subulone flutes, and shown that the double and triple bulbs depicted on the Etruscan vases are essentials of the structure of the flutes, and can no longer be regarded as conventional ornament.

M. Maspero sent Mr. Southgate a tracing of the bulb piece in his possession, who has obliged me with a copy of it. The dark irregular patches are due to accidental adherence of some bitumen. The numerals indicate merely proportions in the interior diameters.

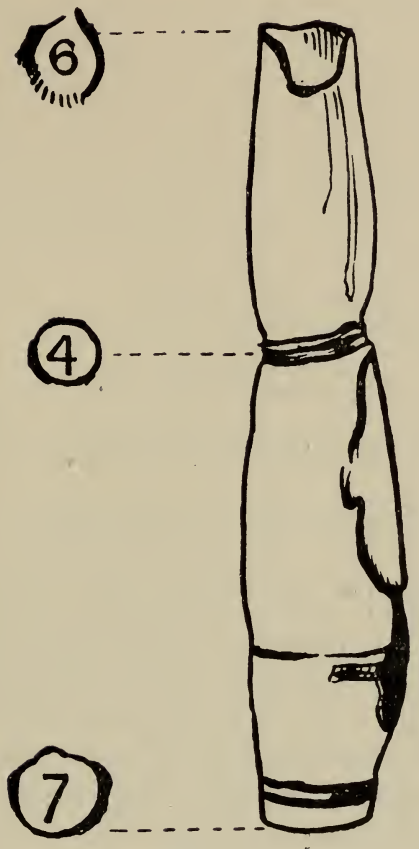


Fig 23.

In the times of the earlier civilizations, men had a wonderfully direct way of obtaining their ends; they chose the simplest means and the fittest, and the survival of their method down to our days is the best proof of a judgment almost as unerring as instinct. With all our mechanical appliances, we can do little better than modify and develop the designs we have inherited. In our wind instruments, everywhere the primitive remains, even as the type of race remains.

CHAPTER X.

The Isles of Greece.

MIDAS THE GLORIOUS.

"The Glorious!" So Pindar names the flute player Midas the Sicilian, who had twice obtained the laurel wreath by his performance on the flutes at the Pythic games. It is in his twelfth ode that Pindar celebrates the victory of Midas over all Greece upon that instrument which Athene herself had invented, and he inscribes the ode thus:—

To Midas of Agragas, winner of the Prize for Flute Playing.

How strangely this sounds to us, and how little able are we to estimate at its true significance the esteem in which flute players were held by all the people of Greece.

Many records there are, telling unmistakably of the passion the Greeks had for this music; of the wealth lavished on the famous players; of the temples in which their names were cut in marble with every token

pride and exultation; and of statues raised to their honour. But greater tribute than any that was given, or than remains, is this,—that Pindar thought the flute player worthy of one of his odes, and immortalized him. His voice was the voice of national feeling, and, as I have said, it sounds strangely to us. We are so civilized, have gone so utterly beyond

"Earth's early days,
When simple pleasures pleased,"

that we should not recognize the voice of Saturn; and if

"The dim echoes of old Triton's horn"

reached our brass belaboured ears, how many think you would listen with reverence?

Yet surely for a little while we should find some good in letting our imagination dwell upon the scenes and surroundings that were real in Greek life; some good also in cherishing the belief that the dead beliefs of old humanity were once living beliefs.

Pindar, second only because Homer was first, was revered by the whole Greek race, and considered their greatest lyric poet. From the pillars of Hercules to the verge of India, wherever there were Greeks, there Pindar was amongst them. How high an honour, therefore, it was that fell to Midas the flute player.

STROPHE.

ay thee, Queen of Splendour, city of peerless grace,
Persephone's home; O thou that on thy tower-clad hill
Dwellest, fair Queen, beside the streams of pastoral Agragas!
Propitious greet, with favour of Heaven, and man's good-will,
The crown, at Pytho's festival, that glorious Midas won;
And welcome him victorious in that fair Art,—of old,
That Pallas found, ...

Then come antistrophe, and again strophe and antistrophe, but without the intervening epode, by which it is known that this was a processional ode. The poet weaves into his strain numerous allusions to myths which were in common acceptance, and fully understood by his hearers, and acclaimed forthwith. Needless, however, to be given here, although scholars still find interest in them. Pindar goes on to state how Maiden Athene fashioned the flute with its varied strain, and bestowed it on man, and concludes with this

ANTISTROPHE.

Through slender brass it flows, through many a reedy quill,
That grew by the Graces town, for choral dance renowned,
In nymph Cephisis' hallowed haunts; true witness of the dancers' skill.
Ne'er, save by toiling, mortal aught of bliss hath found;
But all that lacks in our brief day can destiny's power supply,
What fate ordains none may avoid; needs must a day befall
Of chances unforeseen that spite of all
Man's scheming, part will grant, and part deny!

So ends he, with the poet's right to moralize, by which we may infer that our glorious Midas had to toil at the pipes, and practice some hours daily as the price of attaining his great renown.

Pindar's lines have been variously translated; one reading is thus given :—

Through vocal vent its music flows,
Of brass with slender reed combined,
That near the festive city grows,
Where with light steps the graces move,
Marking the measured dance they wind
In cool Cephisis' flowery grove.

That reads pleasantly; but what of this more stately flow in prose?

When it passes through the slender brass and through the reeds, which grew near the city Charites, the city with beautifu places for the dance.

How charmingly that lingers on the tongue, "the city with beautiful places for the dance." When will it be so said of our great city? Is it a picture past praying for;—past hoping for?

Pindar, as we know, came of a family of flute players. He was born at Thebes, or at an adjacent village, about 522 B.C. His family, we are told, excelled in flute playing, the national art of Bœotia; and he himself, in one of his odes, boasts of a descent from Spartan ancestors, and on his mother's side from an Arcadian nymph, Metope, mother of Thebe, the mythical foundress of the Theban nation. Through the country of Bœotia, the river Cephisus ran into the Copaic Lake, and both river and lake were celebrated for the reed beds, from which the Theban flute makers obtained their materials. So that our poet was an authority upon flutes, and a critic in the art of playing the instruments. A legend records that when a boy, a swarm of bees settled on his lips whilst he was asleep and filled his mouth with honey. He was also believed to be a familiar guest with the priests of Delphi, where an iron chair, on which he sat to conduct his hymns, was shown as one of the curiosities of the temple; whilst at Athens a statue was erected to him, and the Rhodians engraved one of his odes in golden letters on their temple to Minerva, and the site of his house beside the fountain of Dirce was respected for centuries afterwards.

Flute playing was believed to be of Phrygian origin, and that it was brought from Asia Minor into Greece may perhaps be indicated by the fact that Pindar had

in his house at Thebes (Grecian Thebes) a small temple to the Mother of the Gods and Pan, the Phrygian deities to whom the first hymns to the flute were supposed to have been sung. Dion notices that at Thebes all but the Cadmea was in ruins, and that a small votive statue of Hermes, set up for some victory in flute playing, still stood up out of the weeds among the ruins in the ancient Agora. The Pythic contests were held in the plains of Crissa, hard by which stood the temple and oracle of Apollo, the especial god of the Dorian race, and the patron of music and the arts. It was in the years 494 and 490 B.C. that Midas won his laurel crowns, and he had also won once at the Panathenea. Curiously, we find that the first notable flute player at the Pythian games, Sacadas, was victor on the first (586 B.C.) and two subsequent occasions after the performance on that instrument had been introduced as a regular part of the solemnity.

Pindar's ode to Midas was sung at Agrigentum when the victor entered the city in triumphal procession, and the whole town poured out to meet him. The victor and his friends visited in proud succession the altars of his religion, and the titular deities of the city were thanked for their favour, and again his exploits were chanted in notes of solemn joy.

We have one or two flute players who possibly have some idea of their surpassing merits; but they would be aghast if they found themselves recipients of such public honours as these in a modern city,—we are so civilized. Yet stay, did we not receive intelligence how that Sarasate received some such jubilee welcome on returning to his native place in Spain, not very long ago! What an old-fashioned corner of the earth that

must be, where the old atmosphere remains unsmoked, and where the peasants remain and get richly browned in the sun, and dance with goatskins over their shoulders, and to them there are days of out-door life still going on, such as are by our race clean forgotten.

To parallel Pindar and Midas, we should have to imagine Tennyson writing an ode to Sarasate the passionate, the great artist, the dark browed fiddler on the platform of St. James's Hall, London! Ah! no, it will not do; the parallel would be too shaky. We can run excursion trains, and cram Albert Halls, and our people can shout themselves hoarse in Fleet Street over the three o'clock winner, and the names of Patti and Sims Reeves, and Melba, and Jean de Reszke may exhaust our refined fervour, and the grandeur of heads fitted with unseen crowns may raise a flickering illusion of glory, and the dazzling crush of ladies plated with diamonds, may exalt the senses with the pride of wealth,—but all this, the utmost of the get-up of modern effects, will pale beside that uprising of citizens, that grand acclaim in open air over the plain of Crissa to "glorious Midas!"

One day I do remember,—one day fit to be named with the days of old. Stay a moment, and think what *was* in those days. Imagine the concourse of people from all ends of the world; a small world it was then, and yet how great in men, aye, and in coming men. There, under the shadow of the great towering crag of Delphi—the centre or "navel" of the earth, as the Greek poets termed it—with the world-renowned temple glowing in lily whiteness in the blue air, there the great games were held,—duty, religion, race, patriotism, drew all men of Greek birth or parentage

to witness or to share in them. Week after week, from every state and colony, from isle and creek and dented bay, the flower of Hellas gathered in national pride to swell the host of spectators at these Panegyreis, called by them "universal gatherings." Hither came statesmen and philosophers, merchants and traders, poets and priests, and people of every degree; streaming up through gorge and defile, up through groves of pine and laurel and cypress, up to the broad, bright plain,

Around the spot where trod Apollo's foot.

In that great day when Midas stood forth to meet the gaze of the vast assembly, there were, as visitors, some of those who have written their names indelibly on the pages of Time, some of those who have made history. Who were they? Pindar, we know, was there,—what other? At that day, Pythagoras walked upon the earth, and Æschylus was then in the prime of manhood; Sophocles, a babe but one year old, nestled in a mother's arms; and Phidias, a child of seven summers, not yet dreaming of his great fame, tripped over the grass, gathering garlands of hyacinth, saffron, and asphodel; and fancy may picture him there listening to the flutes of Midas, hearing the shout of victory, and seeing the bestowal of the laurel crown. Imagine him —*one of the young immortals*—lifted up in the exciting moment, his little heart throbbing in sympathy with the pulse of the grand enthusiasm that ran through that sunsmitten multitude!

Aye, those were glorious days! One such day I do remember, one worthy to rank with those days of Grecian festivals; the day when our vast city for a whole day welled out from every street and alley its

thousands, tens of thousands, mile upon mile, from morn to sunset, to welcome Garibaldi. Then we knew what it was to feel the thrill of genuine fervour. Then, for one day at least, we rejoiced in being of human race, and believed in the wide kinship of patriotism. Men and women counted themselves happy if they could touch but the folds of his grey cloak. They who had looked into the depths of his calm grey eyes felt themselves dwellers under a loftier sky and went away, comforted; and to gaze upon his serene face was to receive into the heart a new sense of the service of life. He was one of those

> Men whom we
> Build our love round, like an arch of triumph,
> As they pass us on their way to glory
> And to immortality.

Since glorious Midas won, 2397 years have come and gone, and Pindar's verse each year has kept the laurels green. Perhaps in after years he personified the ideal or master flute player to the popular imagination, for the statue here represented dates from the time of Hadrian —that is six hundred years later—and is believed by the archæologists to be a copy or adaptation of an earlier work, when a pseudo-archaic style was in fashion. The original they say may, like other earlier representations of deities, have been clad in actual drapery. According to Pliny, Midas was the original inventor of the *plagiaulos* or side blown flute; but it was so customary to assign to their heroes the origin of things considered benefits to the people, that we may class this as a mythical reminiscence.

The figure is draped in a *chiton*, with sleeves which are fastened down with studs; a circlet rests upon the

head, and the hair falls in long tresses over the shoulders; the beard is long, and of the peculiar shape commented

Midas the Flute Player

Fig. 24.

upon by ancient writers. The marble is beautifully worked, the details very graceful, and the expression given to the face remarkable. The statue was found in the villa of Antoninus Pius, near Civita Lavinia. The right arm, left hand, the mouthpiece, and part of the middle of the pipe are restorations; but the artist, being in the dark as to the actual kind of flute originally represented, made up a shape of mouthpiece from the fragments, for which his inner consciousness alone is responsible.

The flutes represented are from a photograph of the instruments in the British Museum, and there can be

little doubt that this kind of pipe was the one given to the player by the sculptor. The reed when placed in the little tube would stand at half a right angle to the pipe, as the bore indicates that degree of slant.

The Ringed Flutes

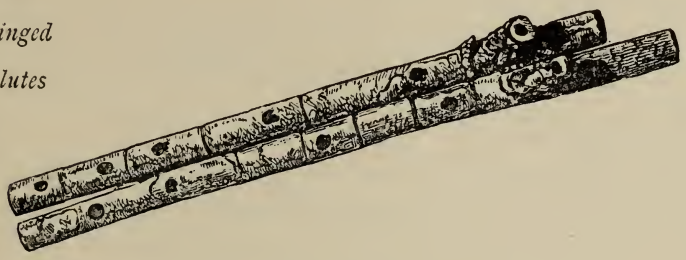


Fig. 25.

In taking leave of Greece and her flutes, I am pleased to be able to quote from recent intelligence one incident which shows the permanence of national character.

"Milo, the Island of the Cyclades, in which the famous 'Venus of Milo' was discovered, has again been the scene of the unearthing of a splendid example of ancient Helenic art. The new 'find' is the marble statue of a boxer, somewhat above life size, which is almost as perfect after its burial under the dust of centuries as it was when it came fresh from the hands of its sculptor.

"The shipping of the statue to Athens was made the occasion for a characteristic Greek popular festival. The whole population, headed by the civil magistrates and a band of musicians, and followed by a regiment of soldiers, accompanied the newly found treasure in jubilant procession to the ship, which had been sent from Athens for its transport to the capital."

The old ways remain! The Greeks are a young

people yet; they show the same spontaneity of enthusiasm, the same joy in the face of nature, the same impulses under the influence of art. Theirs is still a small world girdled by the sea, and they are not so far as we from the days when

> Conquerors thanked the gods
> With laurel chaplets crowned.

CHAPTER XI.

Near the City of Charites.

THE MYSTERY OF THE "SLENDER BRASS."

This chapter is a pendant to that on "Midas the Glorious." It is an afterthought which my long familiarity with free reeds has given birth to. One day I chanced to buy a child's toy, a little trombone, perfect in slide action, and in succession of tones. Following my habit of experimenting with reeds, pursuing therein the course of a lifetime's devotion to such attractions, I naturally desired, childlike, to see the inside of this trombone. It contained a slide within a tube, and upon this slide a series of free reeds set tandem fashion; upon lengthening the trombone, each reed in succession was brought to the one air hole which alone was provided for the issue of the sounds from the series of reeds. For so small an instrument, merely a toy be it remembered, there was great power, and correct pitch.

By a freak of memory, Midas and his flute came to

mind, and words of Pindar flashed through my brain with a new significance. Was the free reed used in the flute of Midas? that was the question. Pindar, as was stated, was himself familiar with the flute; he came of a family of flute players, and therefore his description has a more than casual purport, for we may be sure that he had clearly in mind every detail he directed attention to by his words, and knew everything affecting the instrument. Pindar, having stated how Maiden Athene fashioned the flute with its varied strain, and bestowed it on man, then proceeds to describe it and its musical sound. Of the sound of the flute he writes :—

Through slender brass it flows.

It had not occurred to me before to think of any distinct implication in the words; but now I question very much the pleasantness of a brass tube taken into the mouth, in length nearly two inches, with its vibrating tongue in action; not like a cup-piece outside the lips, as in the trumpet and trombone.

Fancy it: a brassy taste! Surely this was not the idea he would convey, of a player's hot moist lips straining upon a slender tube of brass. We shall get his words more literally in prose :—

When it passes through the slender brass and through the reeds,—which grew near the city Charites, the city with beautiful places for the dance.

The flute itself could not be called slender, being interiorly three eighths of an inch; and, moreover, it was but the casing that was of brass, and that only with flutes after the invention of that sectional arrangement of sliding cylindrical pieces over each aperture, the tube itself being of ivory, or of elder, or of syca-

more. Thus, then, the question arises, What slender brass had Pindar in mind?

Accepting the prose as the more literal translation, note the "and," as if Pindar meant, and *then* through the reeds, and further it may be of importance that the *plural* is given "reeds."

Although I have presented the picture of the two flutes that in style accord with the flute designed by the sculptor as if that upon such Midas played, I believe that a scrutiny of dates forbids the supposition; those flutes will prove to be of too late a date, Midas is certainly more likely to have used the *double* flutes pictured upon the vases,—the bulbed flutes, and not the single ones fingered by the two hands. In the plural case, the two flutes would be rightly described, being the style with the two reed-pipes, one for each hand.

Accepting Pindar's words literally—"slender brass"—I think that we must believe that he meant to describe the reed as of brass: a reed of slender metal through which the breath passed on its way, urging the reed into vibration. Now, what I would suggest is that, if silk reached Greece from China in those days, why should not the free reed? Actually it is of slender brass.

I have made experiments with the free reed upon my copies of the Greek flutes in the British Museum, and see very clearly the possibility of the adaptation of the free reed to the hollow cocoon-like bulb pictured of the flutes in the paintings upon the Etruscan vases, and which, as you have read, I interpret as being designed to hold a reed within it; the first, second, or third bulb being selected for the purpose, according to "the mode" of the particular piece of music that was to be

played. The bulbs are quite large enough for holding the free reed of the requisite size and flexibility.

In the Chinese organ "Sheng" the little brass free reed is fixed on a small quill-like reed stem and is passed through a hole into the *bowl* that holds the series of reeds. The position of the reed for sounding is exactly the same as that which I am supposing for it in the *bulb*.

Again, it has been supposed from a remark made by an ancient reporter that a certain flute player in a contest was unable to play because of an accident by which his flute reed had become bent; that therefore it may have been a metal reed such as the free reed.

The question has also an acoustic bearing; according to Weber's law, the free reed is amenable to variations of pitch: by its nature it is able to accommodate itself, and may be taken down an octave in pitch under the influence of the tube with which it is associated; but upon that descent of pitch being reached, it starts back again to its own pitch. Joining such a reed to the flute, I find that its pitch is lowered as each hole is in succession closed, but that at the last hole it refuses to speak at all. This shows that a different reed should be selected that would be flexible enough to accommodate itself to altered conditions of tube; but to obtain the right reed will demand a course of arduous experiment upon new ground, the best teacher being experience. I said that the reed refuses to speak. Here comes a noticeable fact: by extreme high pressure I can induce it to speak, and that powerfully. Have we not in this fact some hint—or, may be, explanation—of that strange demand of the Greeks, as it seems to us, for a bandage, a *phorbeion*, like a halter over the head, to

prevent the bursting of the cheeks of the player? This intensely produced note may be the kind of note they wanted,—that which they prized and acclaimed in Midas. The probability is that the whole series of notes was produced on this high pressure system, in open air, and intended to be heard by a vast concourse of people. When I played softly or with average strength of breath, I found that I could not take the reed beyond a fourth. Does not this appear to account for the limitation to four holes which so long prevailed? In our own course of evolution of instruments from early times progress has been slow; many centuries passed before the first little brass key was invented and applied to flutes. With the clarionet it was the same: the sudden burst into new life being due to one man,—Denner. From the first to the last period in the development of Greek flutes there were no doubt well marked transition stages of which we possess no record: new inventions equally momentous to them as to us, and upon which new players started into pre-eminence. Midas was credited with the invention of the particular flute upon which he won renown; and it may have been that Pindar intentionally specified it, and that it may have consisted in the application of a free reed of slender brass to obtain a greater range of notes.

The free reed in the way that I have suggested was equally applicable to the double and to the single flute; and therefore, whatever the kind of flute upon which glorious Midas played, and won his laurel wreaths and his immortal renown, the special epithet of Pindar would hold true :—

Through slender brass it flows.

The little brass reeds are easily made, the metal is very

thin, and three strokes of a tiny chisel cut the reed. To a people so skilled in the working of metal in jewellery as the Etruscan and Greek, the making of these fine reeds would present no difficulty. Unfortunately, the slenderness has been adverse to preservation. These perishable reeds,—what tomb enshrines the one which is to satisfy our longing to know! A learned professor tells me that the Pompeiians were of the Oscan tribe, being in their remotest line called the Sabellic race, that they belonged to the large ancient group of the "Aryans." In late times, these people mixed with the Etruscans, Pelasgians, and Safines, and their writing was similar to the Greek; and, according to language, they were related to the Sanskrit and to the Iranian languages,—namely, the Jadian and Persian. So in all our wanderings we are brought back to the old home,—to Persia, where the pathways of music begin.

CHAPTER XII.

At the Delphic Temple.

THE MUSIC HEARD BY THE GREEKS.

The latest discovered Delphian tablet can well claim to be the only authentic record yet brought to light of old Greek music, since it is the original and not a copy of a copy. Not only is it original and genuine beyond dispute, but it has also the inestimable value of being earlier in date by many centuries of any previous record of repute, and so in the style of its music more nearly representative of the simplicity of the best period of the tragic and lyric arts of the Greeks.

In his "History of Music," Mr. W. Chappell gives examples of three Greek hymns with music, the three being in his day the only known trustworthy remains of Greek music. They were published by Vincenzo Galilei, the father of the great astronomer, at Florence in 1581, and had been copied from a Greek manuscript in the library of Cardinal St. Angelo at Rome.

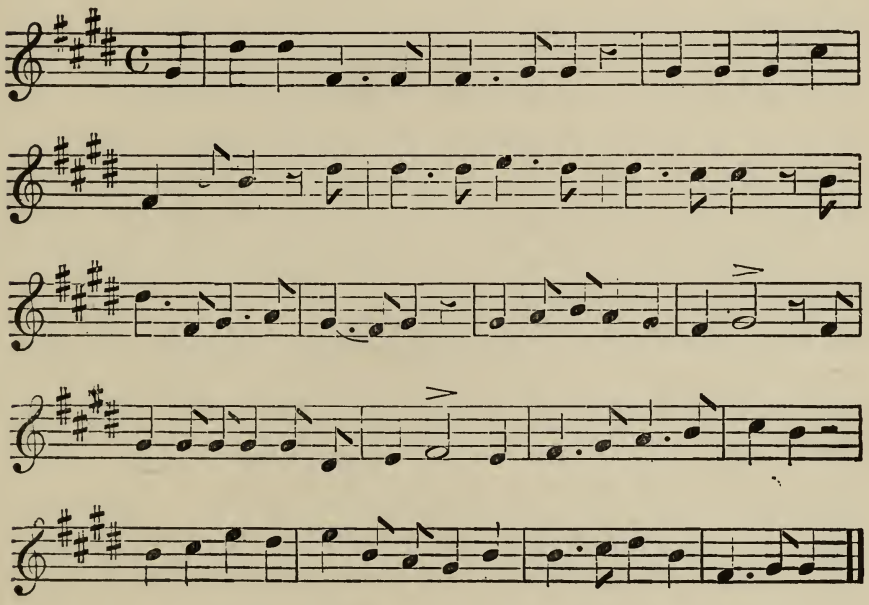
A second Greek MS., which included these same

hymns, was found in the library of Archbishop Usher, and from that the hymns were printed by the Oxford University in 1672. Then, in 1720, a third MS. was found in the library of the King of France at Paris, which also contained these three hymns, which supplied three or four missing notes. Although, as we have the music brought to our notice, it is barred and timed and otherwise dressed up in modern fashion, we have to remember that the Greeks knew nothing of such devices. Their notation was only by letters written above the words, which by their rhythm determined every musical feature: for the poet ruled the music. The letters had their significance as instructions according as they were placed—upright, inverted, jacent both on the back and on the face, turned right or left, and by broken parts of letters and there were accents in addition; and consequently were liable to much misconstruction or error on the part of the copyist. "The time of notes," says Gaudentius, "is to be ruled by the rhythm of the poetry."

So that the music was not strictly syllabic. "The length of irregular syllabic quantities has to subserve, and to be fitted into the *arsis* and *thesis*, or up and down beats, of a foot of verse in the measure that has been adopted." This old custom is familiar to us in our Te Deum and other chants, and in oratorio recitative, and is in fact the most ancient as it has been the most universal feature in the evolution of song. Mr. Chappell quotes a Greek passage "On the Phrasing of a composition," by Dionysius of Halicarnassus. "But rhythm and music diminish and augment the quantities of syllables, so as often to change them to their opposites. Time is *not to be regulated by syllables*, but

syllables by time." We know how our modern rhymesters, who write for the drawing-room or the streets, are given to ricketty irregularities of metre ; but this is from slipshod guiltiness, and is quite of a different order from the poetic disposition of syllabic utterance. Read Coleridge's "Christabel" for the most splendid example of such word music ; or, in later days, Swinburne's lines, which so often give marvellous evidence of the mastery of this rhythmic art.

With these remarks in precaution, we may look at the music to the first of those three relics, the "Hymn to Calliope" as modernly set forth :—



Many readers will be glad to have this example of Greek music, just to see what it is like. The words must be left to experts who can sing them, for it would be of little use to add them here; and whosoever is dis-

posed for further enquiry will find the adapted harmony by G. A. Macfarren in Mr. W. Chappell's book. The above is transposed a fourth lower than according to the mode assigned to it, and an octave higher than the pitch as for a man's voice. The transposition is in accordance with the system of Claudius Ptolemy, who showed how much too high for use the Greek hymns were if taken at the pitch that had been assigned to them.

The second of the three hymns is a "Hymn to Apollo," and is less tunable in style; the third is a "Hymn to Nemesis," sung to the sound of the lyre. No one of the manuscripts is older than fourteen centuries. The authorship of the first two hymns is attributed to Dionysius; in any case the inferences lead to the placing of the date not earlier than from the second to the fourth century of our era. Considering all these indications of the state of our knowledge of Greek music, we cannot wonder at the great and exciting interest aroused by the veritable music on marble so fortunately recovered.

The Greek hymn that was found at Delphi inscribed in marble upon the inner wall of the ancient treasure house, has been sung at Athens. After two thousand years the music lives again. But with what a difference—revivified, yet only strangely alive! Those who incised the hymn, imperishably as they thought upon the marble surface—they had themselves given voice to it, had joined in the sacred service, and felt the thrill of the thousand surrounding voices of a people who believed in their gods. Who now believes? Apollo and the Muses are far off, and the great god Pan is dead. No, the music cannot be the same, for the ears

that listen have lost that inheritance of nature which was the birthright of those early worshippers at the Temple of Delphi. Neither priest nor oracle speak; our privilege as quite a modern people, is to listen to *The Times* own correspondent. We are told that

> The composition is in the Hypo-Dorian mode, and, like most ancient musical compositions, is in a minor key, and written in a peculiar time, with five crotchets to the bar. It was rendered by a quartet of male voices. Some passages are surprisingly modern in character, and the whole composition possesses much of the dignity of the finest German chorales.

And, further, we hear that the hymn was encored. Think of that! The first time, no doubt, of being honoured in such a fashion. What would they have said at Delphi? It is all pastime now, not prayer. And another correspondent gives assurance that

> The performance, which lasted but half-an-hour, was a great success; it produced a profound impression on the audience. Everyone present indeed was ravished by the charm of the music, and its mingled originality, simplicity and grandeur.

Well, I suppose that it is all right; but it is terribly artificial in the reading. You cannot but note that the restorers have been at work; the harmonization by M. Reinach has no doubt been well done. But with that kind of certainty any simple melody of a few notes may be made impressive. A modern quartet! It sounds incongruous, and makes one think of a top hat on a marble statue; and you cannot help the suspicion that the musical composition made tasty was not Greek music. Although we are condemned by our advancement to see and hear according to modern ways, the interest in this Greek fragment remains;

and we all of us curiously want to have the music brought within the range of our own perception, and are presented with the Greek Hymn to Apollo in modern notation, with an imagined suitable harmonization.

The adapted harmony must be taken for what it is worth in relation to music as we require it, and not as upon any evidence in a style likely to have been that used in the Greek singing of the hymn. Indeed, it is difficult to understand upon what principle such a concoction can be justified, for surely the original music has been so dished up to suit the modern palate that the ancient author would be unable to recognise his own hand in it. This harmonized version may rank as French confections in a drawing room entertainment, and help to pass away the time as the latest novelty; but as for any relation to Greek art, only as a travesty can it be taken seriously. The value of the find, as I view it, is that this rescued relic of an elder civilization should help to enable us to realize the actual nature of Greek art in music, and its place in Greek life—either that or nothing; the value is lost if simplicity is lost.

The melody as melody does not attract us; this, as will be seen, Mr. J. P. Mahaffy confirms in his critical remarks, and therefore that is all the more reason why I should plead for sincerity in treatment. Not a note should be altered, not a note should be added to make the flow more agreeable, not a sign or modification be permitted for the sake of smoothness or grace. How eagerly we read a child's letter; how much such young effort interests us because it is the genuine presentment of a child's thoughts; how utterly insignificant it would be to us if we knew that it had been vamped up by a teacher. So with this hymn; it came into exist-

ence, when music as an art was young, and we want to understand it purely and simply in its youthfulness; and for no other reason than that it was a participant in Greek life, when men believed in the gods they worshipped.

Mr. J. P. Mahaffy, in a paper entitled "Recent Archæology," makes some interesting remarks upon the chronicled event. He states that

> M. Reinach determined (from Alypius) the scale to be Phrygian and its component notes, which scale corresponds to our C minor in its melodic form, with some accidentals introduced in one passage. The pitch is a more difficult question. As printed by M. Reinach, the range is too high for any chest voice; but he believes that the ancient practical pitch was one third lower than that assigned to the scale by the late theorists.

Here authorities, as we have seen, differ; and some make the scale to be hypo-Dorian instead of Phrygian, and some say it is Dorian (*e*, *f*, *g*, *a*, *b*, *c*, *d*, *e*) with *a* as keynote. Mr. J. P. Mahaffy goes on to state that

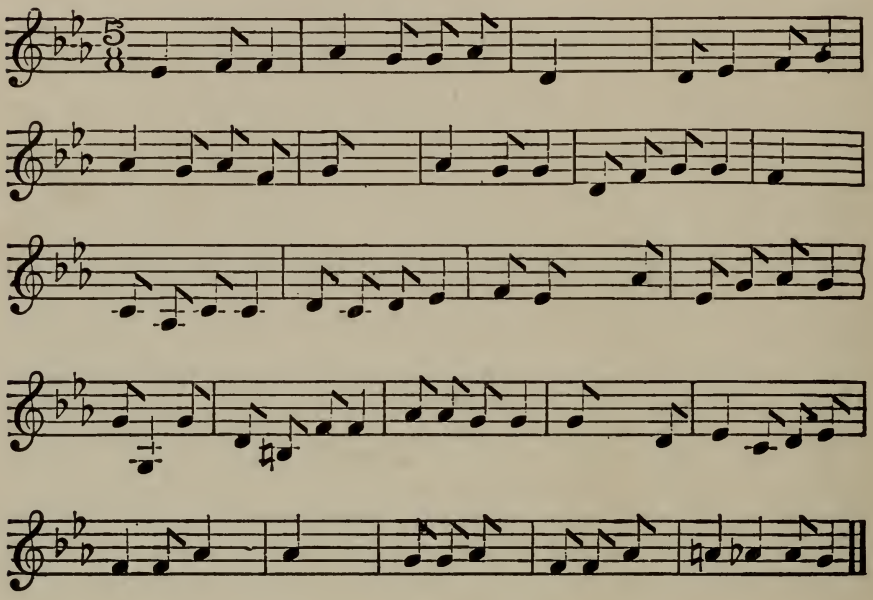
> The time is given by the metre, which is pæonic—a long syllable and three short (variously placed), or two long and a short between them, in every case 5-8 in a bar: a strange measure to us, and very difficult to observe. As regards the accompaniment or harmonizing of the air, their is none extant. We turn lastly to the melody, which is far the most important item in giving us an insight into an old Greek performance. I grieve to say that, although there is rhythm and even a recurrence of phrases to mark the close of the period nothing worthy of being called melody in any modern sense is to be found. The notation of Greek music is well established. It consists of alphabetic letters with or without slight modifications written over the text. Instrumental notes are said to have been written under the text, and with a distinct notation. The poet, tragic or lyric, was also the composer, and set tunes to his odes.

The inscription dates from the third century B C., and this hymn to Apollo and the Muses consists of phrases equal to eighty bars in modern reckoning.

Here then are a few bars of the melody given apart from the French version harmonised by M.M. Fauré and Reinach, and these will sufficiently indicate the character of the remaining portion, which the student, if so inclined can easily obtain. My object in giving these is in order that you may at the same time compare them with a similarly brief example of the Chinese music to the Hymn of Confucius, which will follow.

OPENING OF THE HYMN TO APOLLO.

The time of the blank spaces in the bars is filled by notes sounded upon some instrument; a kithara, I believe.

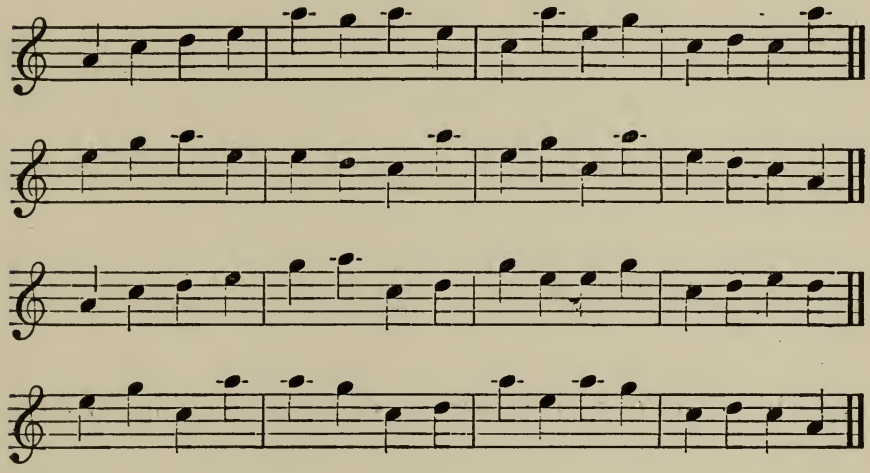


Of course, we ought not to introduce bars; but in default of accentuation determined by the words, we have to avail ourselves of these indications, imperfect as they must be. Our notation also is, in some instances,

only approximate, as both in the Greek and Chinese systems the intervals vary from ours to the extent at times of a quarter tone.

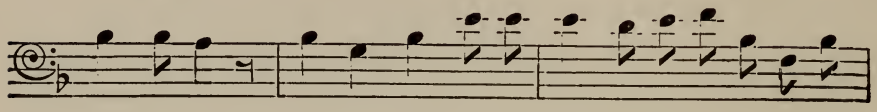
CONCLUDING STROPHES OF THE HYMN TO CONFUCIUS.

The rhythm of the hymn is constructed so as to have four syllables to a line, and at the end of each line in the verses (here occupying one bar), and one of the instruments is appointed to sound three or six times a sort of *interlude* as in our recitatives. The music is simple, as with the Greeks, merely indicated by letters or signs associated with the words. The time taken very slow, probably somewhat as our "Old Hundredth" is sung in village churches according to ancient custom.

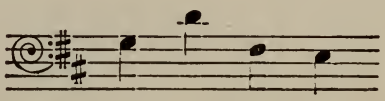


Mr. Abdy Williams gives a fragment of a papyrus roll belonging to the Augustan age, containing the music to chorus from the Orestes of Euripides (about 408 B.C.), from which it appears that the player extemporized a short interlude at the end of the verses. This is very curious, and will not be without significance if we compare this with the ancient Chinese custom

which is so similar. The fragment consists of many bars; but the whole amounts to little beyond repetitions of the following, with now and then a slight variation.



A second hymn (key of G, with C♯) travels very monotonously within these limits.



The compass of the Delphic Greek hymn is one octave and a fourth, and it is curious that this is exactly the compass of the Chinese *Sheng* organ. The pitch is an octave too high for men's voices, even as we find is the case with the original pitch of the Greek music.

Professor Jebb, in his address to the Hellenic Society, speaking of this Delphian relic—this marble music, says:—

The fragments at Delphi were fourteen in number. The principal one contained eighteen lines, and the musical notes were fairly complete,—only nine being missing out of two hundred and seven. The signs for the notes were the ordinary letters of the Greek alphabet, sometimes turned upside down or tilted. A key to them had been given by a Greek writer, Olympios, of the time of the Emperor Julian. He had written an introduction to music, which was still extant, in which he gave a list of signs representing notes. There were two distinct systems of musical notation, for voices and for instruments. Nine of the fourteen fragments were arranged for voices, and five for instruments; these were the lyre and the flute, which were named in the text. The instrumental and vocal music was always in unison. There was never more than one note.

Many musical enthusiasts have a fancy for trying to prove that the Greeks must have used harmony, because they possessed in their scale the notes that would combine in chords; but all attempts in this direction have been fruitless, and according to Greek scholars are likely ever to be so. Grand effects can be obtained by unisonous chant: and the Greek ear was satisfied. Let us be content to learn what their music really was, and not import into it our supercivilized requirements, assured that the dressing up of the antique in modern clothes is alike repugnant to good taste and refined sentiment, and is rejected by those who care for the verity of art.

In remarks on Greek music, Dr. C. Maclean said, "the classical period of Greece has been called the adolescence of intellectual and modern man, and a very beautiful adolescence it was. Unfortunately it has departed," and he quoted the saying of Goethe:—

"The May of Life blooms but once."

a saying that comes home to the experience of all of us, but only do we learn its truth when the May flowers that brought joy into our lives have withered and fallen.

Hitherto the investigation in earliest music has proceeded upon evidences of man's concern with and interest in pipes to make music with. Clearly at first such use of hollow reeds was the accident of the day to any passer-by,—as imagined by Lucretius,

"Fond zephyrs playing on the hollow reeds
First taught the peasant how to use the pipe."

Next came the constructive idea, purpose directed to

an end in view, and the development in a very primitive manner of a series of sounds in some order or regularity of succession; for us this has been the chief consideration fixing our attention, to trace the evolution of system in the construction of instruments, therefrom deductively seeking to arrive at the system of the music. With instruments of all sorts collected with a view to antiquarian or archæological reference and study, I have nothing to do, museums may be filled with them, but unless they show us civilization effective nationally to advance some musical system, to notice them would but encumber with useless matter the enquiry such as I have proposed to myself.

Musical pipes we have traced through several phases of development, from the simplest and earliest pipe up to the ultimate stage in the many-ringed flute, as perfected in the hands of the Greek people. Beyond that it is not necessary to go, because our objective is the Greek system of music, as left to us to be the source of our own. The stringed instruments will show a similar course of development from the one-stringed to the many-stringed. The evidences of this progress are very numerous, existing still, and I have no doubt that the investigation will prove to be equally interesting, for it is with the Greek Lyre that we shall arrive at the *method* of the music.

Meantime ancient China claims attention, for the Chinese hold a parallel course in time with the Egyptians. What has China to tell of earliest music?

CHAPTER XIII.

In the Land of China.

THE OUTSPREAD PHŒNIX.

The Chinese have always been fond of seeking the similitudes and contrasts existing between everything in heaven and earth. So far as they had attained in astronomical knowledge, the number of the planets was five; consequently there could be only five colours, five points of the compass, five elements, five primitive sounds, etc. Music was made the subject of many allegorical comparisons, as twelve moons, twelve sounds, twelve hours, twelve strings. And this strange propensity has quite perverted many of their records of history upon art and science; for whatever remained unknown or doubtful, appears to have been supplied with the utmost confidence upon some imaginary basis of affinity or relation of numbers mystically inevitable. The poetry of the symbol was lost in the pedantry of its exposition.

Certain facts we may accept, but not the garnishing

with which the Chinese philosophers and teachers have surrounded them. Each instrument, according to their logical demand, had an inventor, and the scholastic notion has been to attribute the honour of the invention to an Emperor, and forthwith to account for every detail in it upon some system conformable to the wisdom of the scholastic mind.

Learning has always been greatly honoured in China, and the colleges of the mandarins held with rigid formalism to the doctrines they had received from the past, although it may have been a near past compared with the nations history; and so the mystical teachings of similitudes and affinities, and the occult control of nature by numbers, became to the students fixed verities of science, not to be questioned. What concerns us is that these teachings, as regards Chinese music and musical instruments, confront us with a mass of statements incongruous and contradictory. Something like our heraldic descents; the centuries pass, and the links are manufactured to give a factitious coherence to satisfy the desire for truth.

The *P'ai-hsiao*, here illustrated, is one of the ancient instruments belonging to the Chinese, who hold it to be symbolic, and to represent the phœnix with outspread wings, even as the *Sheng* represents the sacred bird sitting upon her nest. In both, no other reason can be assigned for the particular forms assumed by the instruments, the mystical idea is evidently deeply rooted in the race, and is ineffaceable.

Except for the questions of origin and development, the music of the Chinese can have but little attraction for us. But what I would point out as of interest, is that there have been periods of history during which particular

Fig. 26.
The Chinese P'ai-hsiao.

musical systems held sway, with certain instruments in vogue, and with special methods devised in relation to them. In one age the tetrachord, in another the pentatone, in another the fusion of these, and in another the filling in of semitones to complete a scale seemingly akin to our chromatic. In the earlier periods the wind instruments prevailed, and determined the musical systems ; and in later times the instruments with strings gave rise to new and elaborate discriminations.

The stone chimes and the great bells should be adjudged to very ancient times, although in the rise and fall of dynasties the traditional tones have been changed, and perhaps newer traditions have usurped the old ; until in the confusion, systems that in their origin were many centuries apart became mixed up together as of

one growth. The abstruse theories with which the treatises of the learned are occupied, and the fantastic accretions of symbolism which seem to form the foundations of Chinese literature—all these make the way of the investigator difficult. The rational course is to leave them aside and go to the facts. The instruments themselves represent the past, and are valid evidence.

Père Amiot, of the French Jesuit mission, according to his works, published in 1780, appeared to be so well grounded in everything relating to Chinese history and customs that his statements upon their music passed without contradiction ; and, indeed, so intimate a knowledge did he seem to possess that even confirmation of his views would have been considered needless. Such misplaced reliance has given a century's permanence to misconceptions ; and men of sagacity, in dealing with the matters in question, have blindly followed where Amiot led, each succeeding writer repeating the errors of former writers.

Western theorists prejudge questions of Asiatic music by being so wedded to one particular conception of what a scale ought to exhibit.

Ideas of octaves and fifths and of minor and major, and tone and semitone rule at every corner. The fortuitous nature of men's devices in art is scarcely conceivable when rule and logic claim to divine how art developed. Europeans are ever prone to trouble in accounting for everything, and to desire—almost to design—that facts should fit theory, whether they will or not. The Asiatic mind is little understood by the European mind ; and human nature being outwardly so much alike, we are puzzled at ways of thought and innate tendencies diverging greatly from our own. Whilst acknowledg-

ing a difference in organization, we yet deeming ours to be the proper standard ; our likings to be natural, and foreigners' likings to be queer, if not preposterous. John Chinaman's ear is different to John Bull's ear, somehow, if we could only find out how.

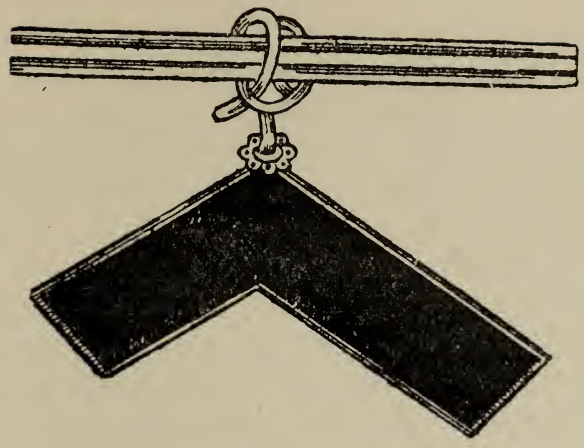
I find that mostly the scientific man is as bigoted as the superstitious man when he brings himself to talk of the beautiful fitness of nature's designs, and of the unerring guidance for our behoof to be found in her operations, and so forth. Now, I know that it is customary to vaunt "nature's *teaching* of harmony and *the diatonic scale*," in the unconscious training she gives us in compounding quality of tone, and furnishing us with a chain of harmonics in a range so nearly out of discrimination of our hearing that, in our average daily life, we are blissfully unaware of the experiences to which we have been subjected. Backed though this doctrine is by the great name of Helmholtz, I confess that I find myself unable to admit its relevance.

First and foremost in the consideration of Chinese music is the fact that the Chinese have no care for our harmony : they will have none of it. Neither will they take to our diatonic scale : it offends their sense of art. Unisons and concords of two notes (as fourths and thirds, and their inversions) satisfy their sense of the harmonious. In this, certain other Eastern nations agree with them. The attempt to find an equal temperament scale as we understand it, of twelve semitones, fails as regards the old instruments.

The *P'ai-hsiao* is reported of as possessing a scale of twelve equally tempered semitones ; the arrangement being of alternate notes right and left, the deepest notes being at each end, and the shortest pipes in the

middle,—a plan adopted in organ building. Not having yet had an instrument of the kind in my hands, I cannot say anything by knowledge; but certainly the scale set out by Van Aalst is not semitonal. For he expressly selects five notes, three being a quarter tone lower and two a quarter tone higher than in a correct scale of the modern type. Even these named had better, I expect, have been named as only approximately a quarter tone wrong; there is no intentional quarter, but a fixed relation to some other notes which by coincidence seem to make agreement, but only more or less near. It is said that the pipes to the right hand are the male or *yang-lüs*, and to the left the *yin-lüs* or females; each class is in playing kept absolutely to itself, which is anything but chromatic in its system. There are sixteen pipes, all the odd numbers being *yang*, and all the even numbers *yin*. The pipes are arranged upon an ornamental frame; they correspond to the twelve *lüs* and the first four *lus* of the grave series; and in notes said to correspond to those of the bell and stone chimes, the highest being treble *b*.

The *Pien-ch'ing*, or stone chime, consists of sixteen stones shaped somewhat as an L; all are of equal length and breadth, and differ only in thickness: the thicker the stone the deeper the sound. That the instrument is of very ancient origin cannot be doubted; but if we seek to place it in its relation to any period of civilisation, we are at fault for lack of data. Its style and weight indicate its design for permanency of abode, and it has been and still is devoted to ritual music. The number of the stones has varied under different dynasties from fourteen to twenty-four. The use of sonorous stone for chiming seems to be peculiar to



The Te-ching, or One of the Chime.

Fig. 27.

China. The *Te-ching* or "single sonorous stone" is in shape similar to a carpenter's square, and its relative dimensions are rigorously adhered to. No doubt it was the best shape for the production of musical sound, and was early discovered by the Chinese to be so. The pitch is determined by the thickness. The best stone for musical purposes is said to be jade, a material for which in the East there is high veneration, though why it should be so esteemed is not clear. The stone is suspended in a frame by a cord passed through a hole bored at the angle, and it is the longer side which is struck by the wooden hammer. The stone chime always takes part with the bell in the ceremonial. Its use is to give a single note at the end of each verse "to receive the sound." It is one of the most ancient of Chinese musical instruments. When an instrument is composed of a number of these stones it is called *Pien-ch'ing*. Usually sixteen of these stones all the same size are placed upon a frame of fantastic orna-

mentation, set in two rows; the difference in pitch is secured by a difference in thickness of each: otherwise all are alike throughout the scale.

The instrument is exclusively used in court and religious ceremonies, and it is said that beyond those in the Confucian temples and imperial palaces it is impossible now to find a complete specimen, though single stones are sometimes met with.

There is a tradition that about two thousand years ago a complete stone chime was found in a pool, and that this model was followed by imperial decree. But this, if correct, does not afford any accurate guidance or tell us what kind of stone chime was extant during the old Hsia, Shang, or Chou dynasties; for not an instrument or book of those periods escaped the great destruction ordered by the Emperor Che Huang-ti; at least, there is no certain evidence against this belief. So that, for the determination of the actual date of the introduction of the supposed equal tempered twelve semitone scale, we remain in the dark, without a clue. Moreover, when the existing stone chimes—or, rather, the *Yün-lo*, or gong chimes constructed to correspond in scale to the stone chimes upon the same twelve *lüs* principle—are submitted to examination of the necessary rigid enquiry by tests, they do not bear out the true semitonal character that has been asserted. Mr. Ellis tested two specimens in the South Kensington Museum, but both differed greatly, and he failed to find anything like the assumed scale; and such scale as he did find he was unable to give any theory for. Van Aalst says that

> It has become exceedingly difficult to find a *Yün-lo* capable of giving a satisfactory gamut; besides, the pitch is not uniform, so that two *Yün-los* rarely agree.

And of the *Pien-ching*, or stone chimes, he states that

> It is exclusively used in court and religious ceremonies, and it would be considered a profanation to use it elsewhere. It is impossible to find a complete instrument for sale, although separate stones may be found. It is not known to whom and to what dynasty the *Pien-ching* may be attributed, but there is no doubt that it is one of the most ancient instruments.

Where then shall we find this semitonal scale, this twelve notes series comprised within the octave?

Considering how very ancient the stone chime is, the question may well arise how the pitch was derived or ascertained, since in the material and dimensions no certain reliance could be placed. Both the stone chime and the *Sheng* are attributed to an era some five thousand years ago (about the time of Noah), and then in those days the Chinese had long been a musical people. It would be but natural to conclude that the *Sheng* conforms most to the *lüs* the ancient and the original determinant of pitch, and we may be quite sure that the pitch given by my pipe is the same to-day as in that remote age. Neither strings nor stones can pretend to the same absolute fixity.

But now listen. "Music in China," says Van Aalst, "has been known since the remotest antiquity. The first invaders of China certainly brought with them certain notions of music. The aborigines themselves had also some kind of musical system, which their conquerors admired and probably mixed with their own. These invaders were a band of immigrants fighting their way among the aborigines, and supposed to have come from the south of the Caspian Sea; remnants of the original *Li*, the *Kuei*, and the *Feng* tribes are said to be still in existence in south China." Is there not

here the hint of a curious problem? By what track came the Phœnix and the Pan's pipes both to Greece and to China? Dim, through sequestered years we should wander back, to some immemorial age, moss grown with primæval traditions, long ere these lands had their names, and in the deep recesses of forests untrodden by the foot of man, peradventure we should find that dwelling place of the great god Pan whence in the earliest of days he came bringing his river reeds and his wild music with him.

CHAPTER XIV.

The Mongols New Home.

THE MYTHICAL FINDING OF THE LÜS.

In considering questions of early origin and of direction of human intelligence, there is no point of more importance to bear in mind than the allowance of long periods for the operation of the process we are now accustomed to call evolution. When we have traced history to its utmost verge in the dim past, the civilization we come then in contact with, in those very ancient days gives evidence of many centuries—aye, even many tens of centuries—having been necessary for that growth of adaptations recognised as the outcome of human intelligence and industry in such communities. So, when I speak of origin, I am thinking of a time when systems were not; of conditions when devices were more the result of spontaneous impulse than deliberate invention.

China, certainly of all existing empires the most ancient, has records which extend almost unbroken

back to a period of 2400 B.C., and then beyond that lies the haze of a remote past, where the light of tradition breaks through with no uncertain radiance, revealing points of distance far, far, away, telling of another 2000 years of the still immeasurable past of the "black-haired people" who settled along the banks of the Great Yellow River, and whose descendants in succeeding centuries spread over the valley of the still greater Yang-tse River, and pushing southward appropriated territory after territory, and who to-day outnumber every other nation on the face of the earth. A strange destiny! to increase, yet not to progress.

Many little digressions into the history and customs of the Chinese seem inevitable in attempting an enquiry into the origin and nature of the musical instruments and music of this singular people.

Of Chinese musical instruments none that are ancient exist, and yet the new are still the old, for so far as can be ascertained there has been no essential difference during the thousands of years of civilized life that they have been in national use, and in the authentic records which refer to them, they are described as already old, in periods that are mythical; the whole family of instruments seem to have been born at one date, without any order of precedence. The Chinese have no modern music. The music in use is only their earliest music reappearing from day to day in immemorial custom, and it is to them a completely satisfying survival.

Their system of music is the oldest system that has been placed on record, and for this reason alone it has a special interest.

In the chapters "At the Gates of the Past," and "In the land of myth" I expressed very clearly the views at

which I had arrived concerning the music of the Chinese and its affiliation to the music of the Greeks, stating my belief that in a far distant past both races were in contact with one source, and then came a day of disruption,—one race eastward, one race westward, each pursuing its own pathway. These two races to us have been known as Egyptians and Chinese. Greece deriving from Egypt, I traced the way therefrom across Arabia to the southern part of the great valley of the Euphrates, called Mesopotamia, Chaldæa, Elam, and further, to the Iranian mountains.

In justification of these views, some considerations should here be advanced as briefly as may be, and although details may have the aspect of being antiquarian, I anticipate that they will help the general readers to the better understanding of the place of music in Chinese history, and in the daily life of the people inhabiting the land modernly known as China.

When I started the enquiry I had no idea where the quest would lead me. It was only afterwards that, prompted by a wider interest in the subject, I found that independently, I had come to a conclusion identical with that of modern research in ethnology, philology, and archæology. My study of the matter is but a simple venture over an untrodden course, seeking the earliest sources of music, and the identity of view of learned authorities may, I think, fairly be taken as strengthening my own.

A few hints concerning these will answer our purpose.

In that southern valley of the Euphrates, the first people named in history were the Akkadians and Sumerians, they came down from the mountains and built cities; the unnamed settlers earlier than these had

occupied the region and were without bond of union sufficient to give them a name in common, yet it should not be forgotten that they, too, had a past, remote in time, though unrecorded as history.

How then do we connect the Chinese with these? The Chinese constitute one of the numerous branches of the Mongolian race. Historians state that the ancient empire of Medea was founded by Mongols. When the first immigrants of this race entered China colonising the fertile valley of the Yellow River, they brought with them evidences of a civilization which it must have taken many, many centuries to have arrived at. Agriculture they were proficient in; astronomy they possess records of, that point to events thousands of years earlier; masonry, and canalization also, in well-developed systems immediately applicable to their new surroundings; and my argument is that they brought also a primitive system of music arising from or out of a simple pipe adoption, having a series of four or five sounds, such as we have found to be the original basis of Egyptian and Greek music. Ancestor worship they also brought with them. A formulated religion they had not, neither had they a priesthood.

Where can be found a common centre, where a population had existed in prehistoric times, at which these chief evidences of civilization had been grouped together in communal or in civic life?

Research can shew but one—and that, the southern valley of the Euphrates.

In his work, "Primitive Civilizations," Mr. E. J. Simcox writes:—

"That the Chinese themselves did not learn agriculture in China is beyond a doubt; the family life of the Chinese does not

go back to a time when the black-haired people were not agricultural."

again as to Astronomy :—

"The astronomical knowledge of the Chinese was almost certainly derived from their kinsmen in Mesopotamia."

Dr. Edkins was struck by the many ancient customs pointing to a connection between Western Asia and China, he calls attention to :—

"the resemblances between Chinese writing and the pre-cuneiform or linear Akkadian character; 'a deep relationship undoubtedly between the vocabulary of the two languages.'"

Both the Revs. C. J. Ball and M. de Lacouperie agree :—

"in regarding Chinese as a representative of a much earlier stage of Turano-Sythic speech than any other living language and as still including elements going back *to some source common* to it, with the founders of Elamo-Babylonian civilization."

Mr. Simcox states that the Akkad religion :—

"was purely naturalistic, it consisted in the recognition of a 'Spirit of Heaven,' and a 'Spirit of Earth,' but these spirits were not worshipped but 'conjured'; hence charms were older than litanies."

and as to ancestor worship Mr. Simcox says :—

"it was the first branch of the Egyptian religion to become *associated with proprietary ideas*, which also constitutes the leading feature of the Chinese religion, the worship of the spirits or manes of deceased ancestors."

On these points we shall notice that much that differentiates the two peoples will tend to show that the Chinese broke away from the Euphrates earlier than the Egyptian kindred, before indeed the anthropomorphic religious ideas became superimposed upon the naturalistic. This is an important index to the distance in time when the migration eastward began. Imagine

that vast valley peopled as Berosus the old Babylonian historian states,—"There was originally in the land of Babylon a multitude of men of foreign race who had settled in Chaldea." These people consisted of numerous tribes, previously dwellers in the forests in the highland range eastwardly bounding the valley, and through long centuries they had multiplied exceedingly; to be called in after time by several distinguishing names. In this early period they were all Akkads from the northern mountains, and Sumerians from the southern range as these names originally imply. Presumably, these people would sort themselves into kindreds, so that when the pressure from increase of population caused them to swarm, they went off in bodies all of the same type. The Red type we may call Egyptians, the Yellow type, or black-haired we call Chinese, the great remaining bulk of dwellers on the soil became the people called Chaldeans, Babylonians, Assyrians and other names. How long ago was it when "the black-haired people" swarmed off? The Chinese chronologers go back 43,000 years B.C. for the earliest tidings of their race, and no doubt their records are but dim traditions, not of China, but of this their primitive home by the Tigris and the Euphrates. Their astronomical calculations are shewn not correct for the land of China but must be referred to the land of Medea and of Southern Asia. The black-haired people took with them a knowledge which was common with all the tribes around them in that valley; their religion, the Sumerian, "the Spirit of heaven," "the Spirit of Earth," nothing more," no gods or goddesses, agriculture and canalization they learnt there, and the building of dwellings of the reed-thatched type from

which they have not departed, and the worship of ancestors common to that early world remains with the Chinese in its most primitive stage, as a traditionary usage almost instinctively connected with the family claims, as a posthumous honouring, not as a feeling of religion. The polytheistic ideas developed later with the other tribes had not then arisen, consequently we find the Chinese settled in their new home with only simple, vague notions of "Spirits" good and harmful, and being a people singularly wanting in imagination, they present still, notwithstanding their long history, an aspect, as a nation, of archaic survival.

These considerations help us to understand how it is that in their music they have shewn so little growth. They drew from the same musical roots as other nations yet remain stunted; socially and intellectually the Chinaman of to-day is the same as the man who was obedient to the rule of Yao, and Hwang-ti, and when the latter formulated the rules that were held to govern the music, the Chinese were content that for ever after music was fixed; they appear to delight in keeping things in a dwarfed state as they take a pride in dwarfed trees, and we of the Western world find it so difficult to understand them, but we still go on trying.

In these hints I think you will find fair justification for my belief in the very remote antiquity of a musical scale, a set sequence of sounds by choice adopted, it may be of four or five sounds, common in its rudimentary stage amongst all the tribes aggregated in Southern Asia, where we have for many scientific reasons a conviction that civilization originated.

The great migrations of peoples were caused by famines, plagues, inundations, overcrowding of popula-

tion, but apart from these the instinctive desire of man to better himself in place and position and possessions was an ever inciting force.

An old Akkadian hymn, perhaps the oldest piece of writing in the world, commences,

"Mankind is born to wander,"

a simple sentence—a premonition of all history. Imagine, if you can, the ages of civilized life necessary to bring the human brain to a conception so philosophic and true as this. Earth is old now. Earth was very old then.

The Chinese affirm that the Emperor Huang Ti, the Yellow Emperor, invented the scale of twelve semitones, called the twelve *lüs*, and according to the record of date this was 4590 years ago. The pitch of the notes of all ancient systems was described by lineal measurements; hence every interval accepted was either the excess or defect resulting from the division of a greater measure, the octave, or the fourth. In some way or other the derived proportions have been grateful to human ears, perhaps because they denote absence of conflict, or presence of symmetry.

The discovery by the Yellow Emperor as narrated reads somewhat fabulous. It is stated that he sent his minister Ling Lun to the valley west of the Kuênlun mountains, where bamboos of regular thickness grow; that Ling Lun cut the piece of bamboo which is between the knots, and the sound emitted by this tube when blown across he considered the bass or tonic; that is our way of naming, not his. The length was equal to one Chinese foot. He then cut a second pipe two thirds of the length of the first, which gave a sound a fifth higher, and continued similar relations

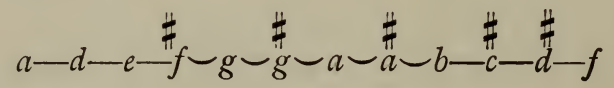
from pipe to pipe, and so on, he completed the series of twelve sounds according to the idea of his master, and for evermore fixed the musical scale handed down from generation to generation through thousands of years.

I have shown that Amiot misled us in assigning it to the *Sheng*, and I expect he has given currency to other errors. What I do note, and have assigned the cause for in the argument of the previous chapter, is the peculiar crowding of the scale with intervals less than a semitone between *f* and *a ;* and perhaps this crowding has helped towards inducing the belief, without question, that the semitonal scale was intended, but that the making of the instrument was not done with due exactness, or that the instrument was out of order if it did not bear out the theory of an equal tempered semitonal succession through an octave. The theoretical existence of such a scale is not here called in question : my contention is that the ancient instruments give no confirmation of having been planned in view of such a principle. Stranger still, the very scheme to which the learned writers refer as the basis of the principle, and carefully guarded by them as an authentic ancient treasure, gives a complete denial to the whole assumption. I take their own statements, the evidence of their own authorities, and wonder, when I examine the twelve *lüs*, why they never examined them, why from curiosity alone they sought no corroboration of their statements from the *lüs* themselves.

In Van Aalst's book the scheme is fully set out in diagram, the twelve *lüs* figured, and all the curious details inserted of the moons and the hours to which each pipe belongs by some mystical relation which the Chinese mind perceives ; the pipes are arranged in the

order in which they bear to the longest one, which is the prime genitor. Also there is another diagram, elaborately designed to display the affinities in a circle, having twelve compartments springing from a common centre ; the *kung* or fundamental sound being placed as the hub of a wheel with the other sounds rayed round, each sound being named. The diagram of pipes shows how the *lüs* generate one another, whereas the circle or wheel diagram gives the notes as they follow in a series. I think that I remember seeing these diagrams in Amiot's sixth volume. Very likely Van Aalst has taken them from the same source. Again, he says, "The *lüs* are a series of bamboo tubes, the longest of which measures nine inches, and which are supposed to render the twelve chromatic semitones of the octave." It appears to me that the great source of misunderstanding has been in the European persistence in regarding "the twelve *lüs*" as meaning "twelve semitones" : whereas the Chinese name *lüs* means laws or principles.

I have examined these pipes by measures and do not find them in any way corroborating the semitonal relation ; and simply taking the names accorded to the *lüs* and set forth in these diagrams, if we arrange the notes in successive order, neither do they bear out the scale claimed for them. Let us see : this is how they stand. Twelve semitones forsooth !



Thus the development of the scale shows only a central crowding of semitones, and not even an octave relation, plainly indicating an ancient growth through

the tetrachord. The diagram showing how the *lüs* generate one another states that the longest pipe is nine inches; yet in the letterpress Van Aalst says that

> The first tube was one foot in length in reality, but that the foot was considered as being only nine inches, because nine is perfectly divisible by three, whereas ten is not.

And further, that

> The twelve *lüs* were used by the Chinese merely to regulate the instruments and give a uniform pitch to the music. The diameter of all the tubes must be the same. Mêne K'ang says that the circumference of all the tubes diminishes according to their length; but this is explicitly contradicted by Tas'i Tzü, who quotes Chêng K'ang-chêng and Ts'ai Yung (two great wine bibbers and famous writers on music), and he flatly declares that Mêng K'ang and his adherents know nothing about music, The tubes were all of the same thickness, circumference and diameter; only the length varied according to the sounds.

And so on, which shows how almost European the Chinese are in their humanity.

I have quoted largely from J. A. Van Aalst's "Chinese Music" to which I am much indebted. The author is learned in the ways and in the literature of the Chinese, being himself in the Chinese Imperial Customs Service, and his work is published by order of the Inspector General of Customs, Shanghai.

The first tube in the diagram bears this inscription :—

> *Huang-Chung*, or yellow bell, corresponds to the eleventh moon and the eleventh hour, emits the sound *kung* (modernly called *yo*), is a *yang-lü*, was the first tube cut, and served as genitor to all the others. It measured one Chinese foot long, and contained exactly twelve hundred grains of millet. Two thirds of its length form the next tube. *Lin-Chung*, or forest bell, gives a note a fifth higher, etc.

Description follows, in the same style of quaint symbolism, upon each of the twelve. At the third pipe, however, which it says ought to be two-thirds of the

preceding length, a change comes, which it is important to notice,—viz., "that the sound would be too high compared with *kung*, and so the tube is to be doubled, and four thirds taken instead of two thirds. This virtually introduces the three fourths relation, the fourth instead of the fifth; and in the remainder of the pipes some are calculated some way, and some the other. There is no twelve fifth scheme carried out as supposed.

Pursuing the investigation, I cut slips on the system laid down, and found that the lengths and the pitches did not agree; and I also tried working out the *Sheng* on a basis of fifths instead of fourths, of the relation $\frac{2}{3}$ instead of $\frac{3}{4}$, and found that the result did not correspond with the speaking lengths of the *Sheng* pipes.

The tale told of the twelve *lüs* bears every evidence of being an invention; and I fancy that the fable originated in a scholastic endeavour to account for the existence of the perfected instrument the *Sheng*, so old that none knew how it came into being. The twelve *lüs* comprised a scale of an octave and a fourth, and the scale of the *Sheng* is also an octave and a fourth in compass; but neither constituted a semitonal scale, which was an idea of much later date. So also the making of a scale out of a succession of twelve fifths was a notion of the pedants, the men learned in book knowledge, and they fixed upon Ling Lun the credit of cutting each pipe by a succession of two-third lengths, on the principle of the fifth.

The question has been raised whether the pipes were open or stopped, and the authorities say they were stopped, and they make their drawings of the pipes corroborate their view, but if so, what becomes of the affirmation that Ling Lun cut the bamboos *between* the knots unless to secure an open tube?

Although I may seem to have been wandering from the track, I have not lost sight of the central point to which my cogitations tend. I wished to impress the evidence of evolution in the appropriation of bamboo pipes for musical purposes, in the use of such bamboos in the earliest periods, all of similar diameters, and to show that variation in the diameters was an after development, even as was the use of metal pipes instead of the natural growth of bamboo or reed.

If you have read the first part of this volume you will have understood that I take the view that the earliest musical notions of man in his primitive state were derived from the industry of his fingers, and the relations of a musical scale had the same basis, becoming afterwards hereditary. The Chinese foot is equal to a handspan of a ruler or emperor, and has ten divisions equal each to a thumb's breadth. The standard pipe is $9\frac{7}{8}$in. of our measure. Taking a pipe that length and halving it, or taking one half that length, the notes obtained are what we call tonic and its octave; but being of the same diameter the octave will be flat. This we find to be a peculiarity in Chinese music. Taking a pipe three quarters the length of the whole, a note is obtained from it which is a fourth; and this, the same diameter being kept, will be inevitably a flat fourth; hence the existence of a flat fourth in the ancient musical instruments of the Chinese and Japanese. And so everywhere, unless the diameters have varied as the lengths have varied, the intervals cannot then have been the exact intervals that we set down for our musical relations. Yet, strange it is: showing the persistence of heredity and tradition. The Chinese in later times perfectly well knew, as I shall show, the rela-

tions of the diameters of pipes according to geometrical laws.

Music with the Chinese, itself as an art so unprogressive, has from the first taken a unique position in the national life. Dr. Wagener tells us that the weights and measures that have been in use these 4600 years in the Chinese empire are based upon Lyng-lun's work in determining the musical standards of the *lüs*. The first pipe which he cut as the foundation of his scale was the longest, and it was found to contain 1200 grains of millet seed. He chose a sort of millet, the *sorghum rubrum*, which is of a dark brown colour, as being harder and more uniform than the gray and other kinds. One hundred of these was made by him the unit of weight, and this was divided and subdivided on a decimal system until a single grain became the lowest weight of all. The length of this pipe was equal to 81 of these seeds placed lengthwise; but breadthwise, it took 100 grains to make the same length: hence the double division 9 + 9 and 10 + 10 was naturally arrived at. This musical foot thus became the standard measure with decimal subdivisions. The breadth of a grain of seed was 1 *fen* (line), 10 *fen* = 1 *tsun* (inch), 10 *tsun* = 1 *che* (foot), 10 *che* = 1 *chang*, 10 *chang* = 1 *ny*. Lyng-lun also fixed the dimensions of the interior of the pipe at 9 grains breadth. The contents of the tube proved to be 1200 grains, and the weight of 100 grains was made by him the unit of weight. The pipe was thus made the basis of the musical system, and equally so the basis of the system for lineal measure, dry measure, and weight; ultimately for coinage.

Another interesting fact is that the Chinese had as-

certained the geometrical relation of musical pipes. The problem had been thoroughly examined by a certain Prince Tsai-Yu (1596). In practical and scientific hydrodynamics, the relation of the diameters of pipes to the volume contained was well known; but it appears that, as applied to sounding pipes, the Prince Tsai-Yu was the first clearly to record its demonstration. Of two musical pipes of the same diameter, one two feet long and the other one foot long, the latter does not, as assumed, give a note the higher octave of the former, for the note will be flat. Neither if we halve the diameter, even as we halve the length, will the note prove true. The common practice with us in organ building is to give the half diameter to the seventeenth pipe; but this is merely an empirical decision. The prince, without explaining theoretically why, showed that the proper dimensions relatively of length and diameter were as follows. Assuming a pipe of 2ft. length to have an interior diameter of 5 lines, then correctly the pipe of 1ft. length should have a diameter of 3 lines 53 cent., and a pipe of 6in. length a diameter of 2 lines 50 cent.

Our organ pipe custom is solely a determination of ear, or feeling, as regards the aggregate of sounds; for we gain in brightness and fluency by not delaying the acceptance of the half diameter until the second octave, which geometrically would be its true position,—viz., at the twenty-fifth note. Thus, and by holding control in regard to the amount of wind, and regulating by voicing, we are able to blend the total accord of sounds in harmony, in the way pleasurable to the trained ear or cultivated taste, according to the perceptivities of the Western peoples.

CHAPTER XV.

In the Flowery Kingdom.

THE BIRD'S NEST.

Music by inspiration. Yes, that is it,—the very thing we want, what we are all longing for ; so little of the truly inspired music comes newly to refresh us as the birth of the days we live in. Only the old seems the ever new. How inspiring it is to listen to the themes of the old masters, and feel the old melodies pass through us like a current of life, awakening thrills of delight, the memory of the first hearing of them blending with and enhancing the emotions of the present. To inspire, "to drink in." How we drink in the life renewing melodies of Beethoven and Schubert: their potency never fails, and in our exultation we call them divine. How strangely inevitable are the ideas we associate with the words "divine" and "inspiration." Apply them as we will to frail human effluences, there is no escape from the higher exalted sense, from the ideal signification. Inspiration,—it is a grand word. Some-

how the ideal clings around words, in however "matter o' fact" way they come to be used; like the eastern vase that has been filled with roses, in after time

"The scent of the roses will cling round it still."

One thought leads to another thought. I have a little instrument before me, dignified by the name "organ," —a very little organ, but the name comes to it because it is one of the earliest of the race from which our present day organ has sprung. Was its inventor a genius? A poor human nomad wandering the wilds of Tartary, inspired to begin the foundations of that which was to be an empire of sound,—one of those

"Who builded better than he knew,"

Was he inspired, I wonder? True it is that the invention has been claimed for some emperor, but that is so natural an appropriation that we give no heed to it. Certainly it is the unknown man who is the true great man, though history has obliterated his name and graven a royal cartouche in its place. The mythical is always later than the real.

This curious instrument: what a juggle of words it has led me to. The inspiration I have to talk of is done by inspiring,—its music is made as the lark's music is, by inspirating. Note you how the bird sings by drawing in breath, by *inspiring*; and higher and higher he mounts, filling the air with melody for a half mile around him; soaring, singing and singing as he soars, never tiring for the hour together, because every effort invigorates the little body instead of exhausting its strength; he drinks in oxygen at every note, and so is refreshed by singing. Would that

human singing were equally refreshing to the singer and the hearer !

The Chinese Sheng. (Quarter Size.)

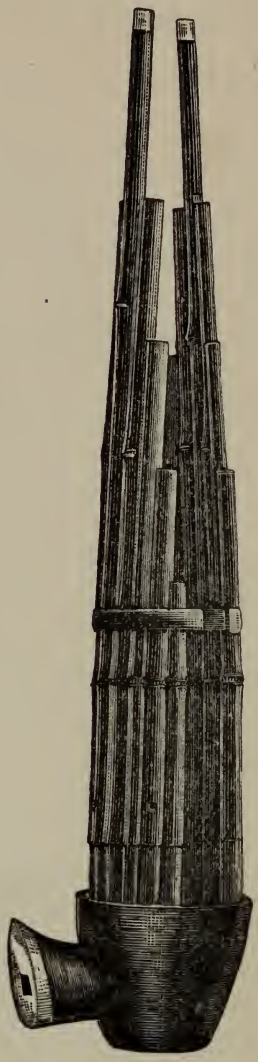


Fig. 28.

The *Sheng* was formerly called the "bird's nest," and the peculiar arrangement of its pipes—the longest of

which pipes exceed considerably the real sounding length—is held by the Chinese to represent the tail of the phœnix as she sits upon her nest; indeed, unless we accept the symbolism, the method shown in the construction is unaccountable.

According to the Chinese there are eight sound giving bodies corresponding to the eight symbols of Fu Hsi, which they believe are the expression of all the changes and permutations which take place in the universe. These eight are stone, metal, silk, bamboo, wood, skin, gourd, clay, with symbolic relations to the eight points of the compass and the eight seasons of the year. The *Sheng* is the representative of the gourd principle. Originally the bowl was formed of a portion of a gourd or calabash, although in later times made of wood and lacquered. This gourd is in shape like a teacup, the top of which is covered by the insertion of a circle of wood, having a series of holes around the margin, into which the pipes are fixed; then there is a neck or mouthpiece shielded by an ivory plate, through which the performer draws the wind. My instrument is an old one, has been in this country eighty years or more; and as it has been here photographed to a scale of one fourth, all the proportions are preserved in the engraving. The instrument is placed to the mouth with the pipes slanting to the right shoulder, the right hand forefinger being placed within the opening seen in the circle of pipes, and the thumb so placed as to be ready to cover the hole seen on the second pipe, counting to the left from this opening. The bowl is held in the hollow of the left hand, with the fingers reaching upwards to the pipes.

A noticeable feature is that it is the left hand that

fingers the instrument, indicating a very early custom. in that respect. The pipe engraved here is of full size, and shows the little metal free reed affixed, which also is drawn at the side full size in its frame. The slot determining the speaking length of the pipe is at the back, and is here indicated at the proper position by the side diagram, the length of pipe above the slot having no particular relation except an average one of about the

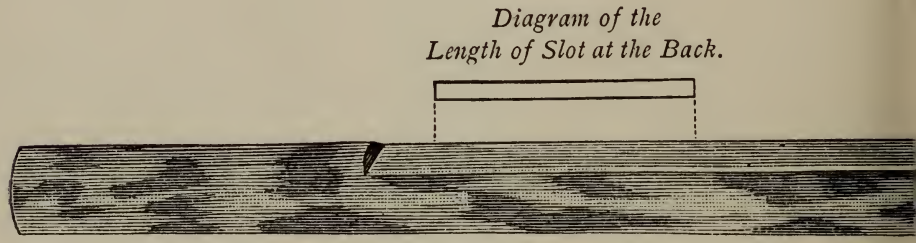


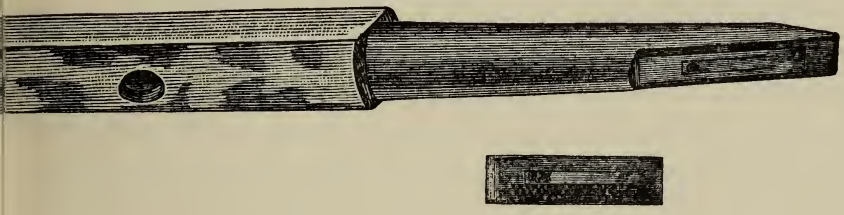
Fig. 29.

A Pipe of the Sheng (Full Size.)

same length as the bottom portion reckoned from the lowest end of the cut. The pipes numbers 3 and 4 have their holes at the inside or back of the pipes in a position to be covered by the forefinger of the right hand.

The little free reed is of copper, is of very delicate workmanship, the tongue is about half an inch long having its tip slightly loaded with beeswax, and the corners rounded off, thus leaving passage way for the

air, otherwise the tongue would not be set in vibration, since the reed tongue is quite level with its frame, a condition in which modern reeds would not speak. It is a peculiarity worth noticing. Another strange contrivance is that the hole which we see on each pipe a short distance above the cup, is designed to prevent the pipe from speaking; is not the opening for the sound of the note as in other pipes is the usual purpose;



The Reed (Full Size)

although the air drawn in comes simultaneously through all the pipes, not a single pipe will sound that has not the side hole covered by a finger. The position of the hole has no relation to nodal distance, it effects its purpose by breaking up the air column when it is open, and so prevents the pipe from furnishing a reciprocating relation to the pitch of the reed. Over these holes the four fingers play in the order the music requires.

The *Sheng* is considered to be one of the most important of the Chinese musical instruments; no other is so perfect either for sweetness or delicacy of construction. It is indispensable in the ritual music of their temples.

At the Confucian ceremonies there are six *Sheng*, three on the east and three on the west side of the hall. They play exactly the same music as the *ti-tza* or flute, yet they are not used in the popular orchestras. At nuptial and funeral processions the *Sheng* is played, but it is then merely for form's sake, in accordance with the requirements of the rites, and the hired coolie who carries it simply simulates playing.

One rarely hears the *Sheng* now-a-days, on account, some say, of a curious superstition that a skilful performer becomes so wedded to its music, that he is ever playing, and that, as the instrument is played by suction or drawing in of the breath, a long continuance in practice brings on inflamation of the lungs; so no performer is believed to live more than forty years! Others however, and these are the philosophers, maintain that the ancient music and the ancient methods of playing are lost, and the construction of the instrument after the ancient plan is a lost art. This one can well believe of an instrument belonging in its prime to so early a period of history. Of all the ancient music nothing remains but abstruse theories. Van Aalst says:—

> The Emperor Che Huang-ti B.C. 246 the destroyer of books came. He ordered the annihilation of all books with the exception of works on medicine, agriculture, and divination. The decree was obeyed as faithfully as possible by an uneducated soldiery, who made it a pretext for domiciliary visits, exactions, and pitiless destruction. Music books and instruments shared the same fate as every object which could give rise to

remembrance of past times; and a long night of ignorance rested on the country to such an extent that at the rise of the Han dynasty the great music master Chi, whose ancestors had for generations held the same dignity, scarcely remembered anything about music but the noise of tinkling bells and dancers' drums.

I have possessed four of these little *Sheng* organs (pronounced "sung") and it became to me a fascinating problem how the instrument originated. I compared one with the other, and where one was imperfect, the other possessed the notes to perfect the scale. At that time but little was known of the instrument, for we had only some flowery accounts given in Chinese history, and one description of it very fully set out in Pére Amiot's work on the Chinese, published in Paris, 1780, in six vols. The description is found in the sixth volume, but I soon discovered that the good father had but very imperfect means at his command, and that the scale he gave was not to be relied upon. For my own satisfaction I was led to make a closer examination of the instrument, and to glean whatever particulars I could for the better understanding of the organ and its place in history.

We are accustomed to regard the Chinese as a very conservative people, unchangeable in modes and customs, and indisposed to vary in routine after tradition has fixed it. Closer view of their history shows that this is a mistake, and we have been drawn into it because the range of their change has been limited; and in their inventions, numerous and important as they have been, they nevertheless seem not to have the aptitude to advance them to higher grade of utility. Their musical scales have been constantly fixed, and have been as constantly changing. Mr. A. J. Ellis has

shown that at B.C. 1300 the scale had only five notes, that the invading Mongols introduced an additional scale, that Kublai Khan A.D. 1259 combined the two, that in the thirteenth century the Ming dynasty excluded all semitones, that the Tsing dynasty (which has existed from 1644), reverted to the former scale; and these are comparatively modern changes. And yet one may say that ages earlier changes began, and this *Sheng* has at various periods been subject to change; at one time it had nineteen pipes, at another twenty-four pipes, and now has settled down to the form, still very ancient, which is illustrated here with seventeen pipes, two of these being dummies—as some modern organ fronts are—and two are duplicates of others for convenience, leaving therefore eleven sounding pipes to represent the working scale of the instrument.

For the origin of the *Sheng* we must go back beyond these periods of change. Its history begins with a woman, as is proper in tradition, and the invention is attributed to a female sovereign in the mythical age known as Nu-wo. Eve is said to have brought "woe" into the world, but this lady evidently by her name was of later date, ancient though that date is. She succeeded the Emperor Fu Hsi, who reigned 4745 years ago, and who was the reputed father of music, for the Chinese are a people who naturally consider that there is no music of any account besides their own. Then Hwang Ti "the Yellow Emperor," follows, and he takes credit for the invention, its a way men have: this was about one hundred and fifty years after the death of the lady aforesaid. Then the great Emperor Shun four centuries later, he lays some claim;

but the probability is that these two emperors regulated the laws, which till then had not been formulated into fixed rule. Indeed each emperor had his own system, and did not agree with his predecessor's systems. There can be no doubt that the *Sheng* is of great antiquity ; it is often mentioned in the great poetical books of the Chinese, the *She* and the *Shoo-king*, and the commentators on ancient musical instruments invariably mention the great age of the *Sheng*, and seem to delight in speaking of it as evidence of the inventive genius and musical talent of the Chinese.

In my desire to place you abreast with the Chinese knowledge of the art of music, I give you this beautiful elucidation from the treatise of J. A. van Aalst :—

> According to the Chinese ideas, music rests on two fundamental principles,—the *shên-li*, or spiritual immaterial principle ; and the *ch'i-shu*, or substantial form. All natural productions are represented by unity ; all that requires perfecting at the hands of man is classed under the generic term, *wan*, plurality. Unity is above, it is heaven ; plurality is below, it is earth. The immaterial principle is above,—that is, it is inherent in natural bodies, and is considered their *pên*, basis, origin. The material principle is below ; it is the *hsing*, form or figure of the *shên-li*. The form is limited to its proper shape by *shu*, number, and it is subjected to the rule of the *shên-li*. Therefore, when the material principle of music—that is, the instruments—is clearly and rightly illustrated, the corresponding spiritual principle—that is, the essence, the sounds of music—becomes perfectly manifest and the State's affairs are successfully conducted.

You will now be able thoroughly to understand something of the Chinese systems of music, and their rigidly scholastic basis ; and should you think that the explanation that you have read requires to be supplemented by explication, I may say that the authorities at the British Museum have now shelved for public use in the King's Library the five thousand and twenty

volumes of the Chinese Encyclopædia, to which I refer you.

This is said to be the only complete copy known in Europe of a work commenced how many centuries ago I forget; and as the Chinese had at hand four hundred and eighty-two learned treatises on music, no doubt the subject is exhaustively drawn out, and will repay your search in the various sections and sub-sections. It is said that in 2277 B.C. there were twenty-two authors on dance and music, twenty-three on ancient music, twenty-four on the playing of the *kin* and the *chi*, twenty-four on solemn occasions, and twenty-six on scale construction. The sages alone comprehend the canons, and the mandarins of music are considered superior to those of mathematics. The College of Mandarins at Pekin is within the imperial palace. The head musician in China represents the five capital virtues,—humanity, justice, politeness, wisdom and rectitude. How very old these people are! Certainly, we have colleges—a few!—but for some reason or other we are not sufficiently advanced to have such a head musician; and, in consequence of lack of such representation, the profession may possibly be minus some of the virtues in these ways: which, as the saying goes, accounts for it.

You know that old Confucius wrote about the ancient music in the *Shoo-king*, and that was about 551 B.C., or about the time when Ezra was occupied in collecting the parchments of the laws of Moses. In the great destruction of books all copies of Confucius disappeared, but happily one complete copy was found secreted in the wall of the house that he dwelt in; and that was in 140 B.C., when the house was pulled down. But you

must think of a time far back, far as the times of the Pharaohs who built the pyramids, a time when the Chinese were already writing learned works on the music and the instruments, the existence of which necessarily implied long periods of early civilization. The earliest Chinese book that we know of is "The Book of Changes," 1150 B.C. Ah, and what changes since! All history is a record of changes.

CHAPTER XVI.

By the Yellow River.

THE EVOLUTION OF THE SHENG.

The *Sheng* as the parent of organs, the original exemplar of free reeds, always greatly interested me, and I was desirous of obtaining a knowledge of its scale and methods; but I found such contradictory statements, such confusion of different systems of succeeding times, that the unravelling seemed hopeless. No doubt, as time went on, certain accommodations were made to conform to new orders and imperial decrees, and the pedants of the schools seem to have been chiefly concerned in the demonstration of doctrines of similitude, and contrasts, and affinities, and mystical comparisons with all things in heaven and earth, and abstruse relations with numbers; sometimes one set of teachings gaining prominence, only to be overturned in favour of the next set that forced its sway into law or custom.

The curious principle of inspiring in order to obtain

the action of the reed, and the still more peculiar characteristic of closing the aperture at the side before the sound could form itself in the tube, raised a multitude of questions of origin and purpose, and therefore I set about the investigation with the idea of working out the evolution of the *Sheng* from the evidence, so to speak, of its own skeleton that to-day is living.

I want to take you back in imagination ages beyond these dates, to find the man who made this little organ, this little *Sheng* that to-day can arrest our attention with absorbing interest. There was some first dreamer, inventor, originator; some one who played and toyed with the bamboos that grew beside his path, and thought out this little thing that was to descend from generation to generation, and become a household name in huts and palaces and temples. In the far east the bamboo is everywhere the resource of man for the supply of his daily needs. With it he hunts and fishes, and builds his house and ploughs his land; he is as much beholden to it now as in most primitive days of nomadic life.

There are whole forests of bamboo in China and immense quantities are floated down the great rivers to the towns and cities; the province of Shantung is celebrated for the small hard sort, which for certain uses has a preference. Just as in Greece we alluded to a kind specially sought for musical purposes. It would, we can understand, be natural for the early tribes to settle down beside the river; and, when a plot of land was selected, the house was built with bamboo, and furnished with domestic articles of bamboo, and the implements of husbandry and fishing were all made of this wonderful plant. With the river to give him fish,

and the land to yield him crops of millet and rice, the man was happy. The custom obtains to the present day to devote some portion of land round the house on which to cultivate the bamboo. This portion is surrounded by a ditch filled with water supplied from the river by a tiny canal, and here these luxuriant grasses grow ; for the bamboo is but a gigantic grass, and the domestic wants find this grove a perpetual storehouse of supply. Conceive such a picture : the man after his day's toil sitting beside this grove, not in lazy ease, but intently engaged upon a heap of little bamboo sticks, measuring, cutting, comparing, and pondering over some problem, some scheme upon which his mind is fixed ; only now and then looking upward and catching sight of the grey turtle doves and their little rose coloured feet clinging to the branch stems above him. No sound disturbing the great silence of the plain, only the doves mildly cooing as if in answer to the sounds that come from his lips in intervals of meditative musing ; and the sounds of the bees in the flowers ; and the softer sounds of the flowing of the broad river in the distance. As the sunshine lights up his good humoured face, what is the thought that makes it brighten with his smile, and tells of satisfied attainment ? Well may he feel content. He has perfected an idea ; he has laid the foundation of the *Sheng*. And a very simple process it is, as I shall show you ; for although it occasioned him serious pondering, once the idea had risen in his mind, the working out of the scheme was assured.

Some tribes in remote places in the east still have a rude prototype of the instrument, consisting of a hollow lump of clay with four or five pipes irregularly stuck in,

and beyond that they have not proceeded ; and such may have been the stage at which our ideal man with an order loving brain set about thinking. Now, truth to tell, I imagined myself to be this Chinaman, and wondered how, in such a position as his, and with only his means and his purposes, I should evolve such an instrument. Curiously enough, as it turned out, I hit upon the right idea, or as near proof of rightness as imagination need come to. Until I had worked out the scheme on this primitive basis, the instrument had been a puzzle to me, and it did not seem to me that any writer rightly understood it ; and even the descriptions by musical experts were obviously erroneous when examined without prepossessions of the scholastic kind. The first instrument that came into my hands was perfect in structure, but incomplete in reeds, not more than four or five metal tongues remaining. The pitch of these I ascertained, and the relations happened to be useful for comparative deductions. It had long been a creed with me that disease and death are our best teachers ; they cause us to question natural mechanism, injury and disorder, and make us desire to know relation and purpose in artificial mechanism also. Thus my poor *Sheng* incited me to wish to know its structural meaning, to ask how it came to be what it is.

Music was a pastime ages before it became an art. Religion is earlier than priesthood. I go therefore to the man who first made this form of instrument ; question why he made it, how he took his first step, how he came to take his second, how he by process of thinking formed an instrument for himself and for others to play. His ancestors, I consider, came from the south, and in the early period would have used reeds

with tongues cut in them after the fashion of the *Arghool;* but this man is an artificer, has more civilised ways in communities of industry, and is influenced by the beginnings of commerce. China is rich in mines of iron and copper and zinc, and her people were a deft fingered race, expert in delicate working of metals, and, at this stage of advance in simple arts the tongues of reed would be superseded by tongues of metal, thin and elastic, and free from the disadvantages of swelling by moisture and of the need of frequent renewals. Hence, in cutting such substitutes by the minute chisels they are so clever in using, the tongue or reed would naturally, and without design, turn out to be a *free reed.* A discovery having far reaching consequences, albeit long limited to the land of this peculiar people, due to the special deftness they have in the fine working of copper; for these reed plates are of little more than paper thickness. Just three cuts of a thin chisel, and the tongue is formed in the little brass plate; and the plate is fixed in its place with beeswax.

Let us imagine our worker to live at this particular period of growth of a civilised community, when music was scarcely more than a chirping of birds, or the aimless sounds which arose as rhythmical ebullition in dancing; when musical art was personal, unformed and any system of musical sounds as yet unthought of. Such a time there must have been in the history of every early race. Always, as I imagine, that the instrument coming, before the system, originates that liking in the human sentiency which heredity and custom confirm. The peculiarity of Chinese music corroborates this notion of mine; for although, so far as we can tell, the structure of musical ears is the same

—yet likings of the ear vary widely with the difference in race.

One of the first needs of men in relation to one another in communities is a standard of measure of length, such as a cubit, a foot, etc. The oldest standard with the Chinese is the thumb's breadth, and ten thumbs' breadths make one Chinese foot; and they had a measure of millet seed, as we have our three barley corns making one inch. Our worker then had his measure of the foot, for that is the standard he sets out with for his longest pipe, from which all the rest originate. It is $9\frac{7}{8}$in. of our measure; and by the same custom the longest pipe of the twelve *lus* which are mythically attributed to the Yellow Emperor, is of like length. So the Chinese foot predetermined the standard both for the reed pipe of bamboo with a tongue of metal, and for the reed pipe blown across as the pandean pipe is blown across: which pipe from immemorial days has remained in the imperial archives, as the unalterable standard of pitch—unalterable because nature does not alter.

I had a metal organ-pipe made to the precise length and diameter of this imperial standard, and it proved to be what we call *e* flat; which, as I found out, has a significant relation, for our free reed pipe of this length gives a sound one fourth lower exactly—namely B flat. And this relation of the fourth dominates everything in the evolution of music. Our worker found this out; though knowing nothing of the interval of the fourth, he fixed it by natural evolution,—by measure, not by music: yet the measure afterwards made the music and the law of the music. I see him cut reeds as our country boys do from our grasses and spiers, and split

a tongue on the side of one, as his ancestors had done centuries before, and make a piping-bird sound from it. He has some knowledge of the working of metals; is an adept at it; has by socialisation and its wants become an artificer in brass. The split reed becomes spoilt after frequent use, so he conceived the thought of making a substitute in metal.

Let us picture him first as taking a bamboo reed, cutting it a foot long in Chinese length ($9\frac{7}{8}$in.), and from this obtaining a note; then cutting other reeds promiscuously, until at last he is attracted by one exactly half its length, giving a baby note exactly the same in seeming as the other, and blending into it. This is what we call the octave,—a civilized perceptivity not yet dawning on his mind; to him it is the man's voice and then the woman's voice. The higher repetition of the same sound. He has halved the length and obtained unwittingly the octave; why not halve the other half between? This he does, and from the three quarter length of pipe obtains a new sound, which, sounded with his prime gives a pleasing concord; thus, he begins to recognise the new fact,—the family relationship.

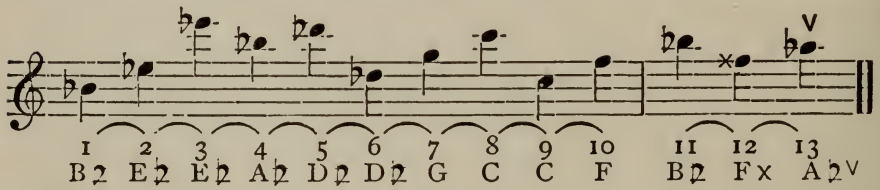
After this fashion of halving and quartering I imagined that the *Sheng* grew and became an instrument; and, placing myself in this mood of representative thought, I also try and work the thing as he would have worked it out, and see if I can get coinciding results. The half and the half again seem to me so natural; the repetition is so akin to the Chinese tendency. A two thirds is a more artificial notion, and comes of later discernment. How natural too, it is on finding more that two pipes inconvenient within the mouth, to seek the first substitute

similar to the mouth in size, such as a little bowl, a half gourd, or perhaps the same calabash that served him for a drinking cup. Except the four or five reeds that spoke in my specimen, I did not know what the notes should be as the scale of the instrument; I only knew that the scheme as told me by the writers with authority was wrong, and was also misleading; for the comparative speaking length of the pipes was at variance with the assumed musical system, and I could not make head or tail of the instrument until I resorted to the question of primitive design. Then everything fell into proper place with unlooked-for significance. So I took a number of slips of wood (easier to cut than bamboo), and proceeded to transmigrate myself into a dweller in "far Cathay."

Adopting the measure of the Chinese foot to start with, I cut a slip to that length, and then cut one to half of that, and then cut one between these at the half of the half, and so on by progressive steps halving and half halving and doubling, and obtained a connected series of thirteen slips to represent the speaking pipes of my most mysterious little *Sheng*. I argued with myself that in some such simple way our worker would have evolved the instrument; that it was by no means the outcome of a system of music, but was built up on a visible relation of proportions; that the eye made it and that the ear accepted it. Steadied by faith, I drew my bow at a venture, and, lo and behold!—my arrow went home true, and I was astonished as one who sees his prophecy fulfilled and wonders how it came to pass. For when I came to compare and to measure the actual pipe lengths, they corresponded length for length with the series I had evolved by my archaic process. I

confess that the situation was bewildering as I gazed upon the evidence before me, for it seemed too good to be true, and one had a fleeting suspicion of magic or hallucination of some kind. But no ; reason and time only increased the strength of my conviction that in this process the *Sheng* was constructively worked out ; indeed, I do not see how by any other way the peculiar scale of the instrument could have originated.

SEQUENCE OF EVOLUTION OF THE PIPES OF THE SHENG.



Remember that at the time of my investigation—now thirty years ago—I had no means of knowing what the scale should be, and I had to calculate from the relative lengths of the thirteen slips what the notes of the speaking pipes would be ; and when in after years I came to possess other specimens of the instrument, I found that all my conclusions had been correct.

A very impressive result is the discovery that the old Chinese musical basis was that of the Greeks,—the tetrachord ; and the complete scale of this, one of the most ancient of Chinese instruments, consists of two conjunct tetrachords and one disjunct tetrachord ; which scale, as I have said, being founded upon a natural law of progression from or through a connected series of proportional lengths, exhibits unchanged its record of evolution. For pipes of certain length give now the same tones and the same actual pitches as they

gave thousands of years ago. They do not change, though modes and customs, peoples and empires change. How remarkably suggestive is this taken with the presence of the Pan's pipes and the Phœnix, to which your attention was given in a previous chapter, as pointing to a common origin in some ancient era ere history began. Helmholtz notes that Olympos (*circa* B.C. 660-620), who introduced Asiatic flute music into Greece and adapted it into Greek tastes, transformed the Greek Doric scale into one of five tones, the old enharmonic scale,

$$b \smile c — — e \smile f — — a$$

This, he says, seems to indicate that he brought a scale of five tones with him from Asia. And this same scale you will find in the scale of the *Sheng*. I gave all this evidence respecting the scale of the *Sheng* more than twenty-five years ago, to Mr. Ellis; but it was a long time before he could bring himself to believe that Amiot and other leading writers had given altogether misleading statements. He went and pored over the big folio volumes of Amiot's "Mémoires des Chinois" (1780), utterly confused; and only in later times, when investigating for his work of marvellous patience, "On the Musical Scales of Various Nations," did he see that truly the tetrachord was the basis of Asiatic music as it was of Greek music.

How was it that Amiot, living with the Chinese, gave a wrong drawing of the free reed used in the *Sheng?* How came he to say with authority that its thirteen pipes were a succession of semitones? How came he to select *f* as the tonic of the scale? Engel falls into the same notion of thirteen pipes giving the same octave of

semitones as ours, but says that the *e* and *b* were exceptional notes, only used occasionally.

ORDER OF THE PIPES AS THEY STAND IN THE SHE NG.

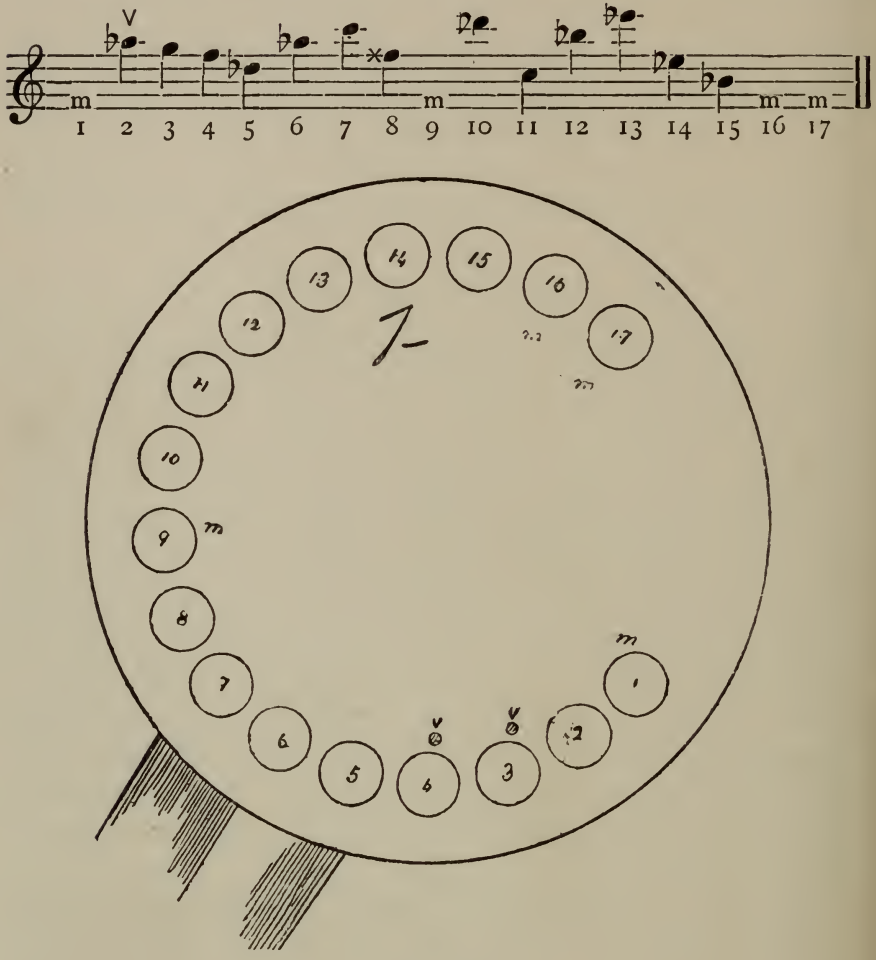
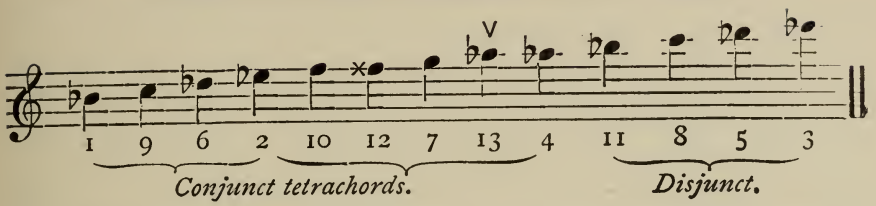


Fig. 30.

The illustration gives the series of holes into which the pipes are fitted on the top of the covered bowl. Pipes 1, 9, 16, 17 are mutes, only placed for symmetry. Be careful in references not to confuse the numerals as to order of pipes with those of the sequence and scale.

SCALE OF THE SOUNDS OF THE SHENG.



These numbers indicate the sequence in evolution of pipe lengths by the process described.

The scale really comprises one octave and a fourth and the *master pipe* is the *e♭*, it being so marked on every instrument I have handled, as shown in the illustration at pipe 14. This is the pipe giving the note corresponding in pitch to the imperial standard pipe, yet it is one fourth less than that in length, because, though both are cylindrical, the one is whistle or flute blown and the other reed blown—such is the law of these reed pipes—whilst the real standard length standing beside it, No. 15, gives a sound a fourth lower, and is the lowest in sound in the scale.

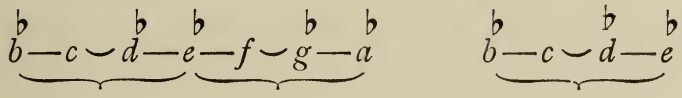
Yet *b♭* is not the tonic; the Chinese have not in their music our kind of reckoning; but their *e♭*, at the junction of the two tetrachords, corresponds to the *mese* or middle note of the Greek scale. And in passing let me say that in the middle tetrachord you leave out in descending the notes 10 and 4, and in ascending leave out 12 and 13, according as the conjunct tetrachords are formed in the upper or in the lower part of the scale; and thus the conditions required by the tetrachord are maintained. Although, to make exposition easy, the notes are here presented in our modern notation, you should still bear in mind that the relations of note to note are not the same, are not exact in ratios; most of

the notes are flatter or sharper than indicated, for the simple reason that there is no other ratio of interval than the fourth taken in relation to intervening upper or lower octaves; and since two fourths will not comprise an octave, each successive step in fourths that are perfect takes us away from diatonic accuracy. Thus the *g* given as a fourth above *d*♭ looks odd; yet it is from that actual pitch *length*, as one may say, that the *c* above is derived. The *c* is a flat note not expressed by our notation, but we have to signify the notes in the nearest terms we can for convenience, none being quite accurate. A very curious puzzle, you will answer; but very clear I can assure you when you have once found your way through the labyrinth.

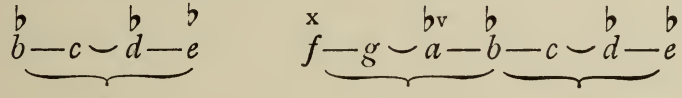
Writers upon the *Sheng* all say that the pipes in the range numbered 2 and 6 are mere duplicates, and also 4 and 8. But they are altogether mistaken; they give not any intimation whatever why they exist. If it had been so then speaking lengths would have been in duplicate, which they are not. But I can demonstrate why they are there; and that they are not duplicates either as regards length or in pitch, but are necessary in the evolution. There is nothing fantastic in the arrangement; all the notes come naturally from one to the other; they are necessary; not one too many to complete the idea, not one left out; and, in truth, that *last* one in the sequence given of evolution—which I have marked b^{v}_{a}, to indicate an extra flatness—has every suggestion of being an afterthought. For the pipe No. 2 in the order exists for no other reason than to make an A♭ that shall be a true fourth to the high D♭; a sounding pipe, for which a place is found where otherwise a second mute pipe would have been, corres-

ponding with that on the opposite side. Why are there two pipes with the ventage hole turned inwards to be closed by a finger of the right hand? Because the thumb ranges over several pipes, but could not properly close more than one at a time; and to meet the difficulty, pipes 3 and 4 have the closure operating behind. So that when required for making fourths or thirds with 2 or 5 or 6 or 7, in the order that comes under the thumb of the right hand, then the finger comes to aid in producing the simple concords desired. Certainly the contrivance in its directness and efficiency is very clever.

The scale therefore is, after casting out the alternatives not required in ascending, as follows. See how very Greek it is.



And in the alternative:—



Here the *f*x makes a perfect fourth to ♭*b*, but would not to *c* below; and ♭*a*^{v} makes a perfect fourth to ♭*d* above, but would not to ♭*e* below. Each *c* is to be taken as much nearer the *b*♭ than in our notation. The pentatonic is obtained by skipping over the half tones. These mysteries you can unravel if you care to take the trouble to cut strips of paper as I did of wood. Number them all at the bottom, and from the 9$\frac{7}{8}$in. length you will get its fourth,—that is to say, three quarters of its original. Write on each the name of the note. And so

on, getting octaves and fourths above or below, in the sequence I have given. As you go on, cut the strips to the lengths found and fold each strip in length into four; and then when you lay them out these curious tonal relations are made manifest. Thus you see why the sounds are what they are. The true lengths would prove in sounds perfect fourths if the diameters of the pipes had carried the geometrical law.

Strangest of all remains the fact that my blind sticks proved true prophets, and led me in the way of evolution, the pitches of the pipes corroborating at every step.

Reverting now to the details of the *Sheng*, there is one little hint too important to be omitted if any reader should happen to have the opportunity of measuring the actual pipes. He will find that the pipe that is longest in the speaking length—that is to say reckoning from the lower end of the slot—will be $10\frac{1}{8}$in. in length, instead of $9\frac{7}{8}$in. This excess of a quarter of an inch is common to all the pipes, and is that portion extended beyond the hollowed part of the foot which only reaches to the base of the metal tongue, and is therefore the real limit of the column of air. Consequently, this quarter should be allowed *off each pipe* when measured, because if computed in the speaking length it would affect the accuracy of the half lengths. In my first analysis, I found difficulties arose when comparisons were instituted between the pipes themselves and the slips of wood of the lengths evolved as a problem; because, as I soon became aware, upon halving the total lengths as taken actually from the pipes, the half of this quarter inch was entering into every calculation, and was of course misrepresenting by an eighth of an inch the real speaking length to be credited to the

half length and the three fourths length ; and with the shortest of the pipes the discrepancy became serious.

Time also, I found, had occasioned a little variation. as the bamboos in drying lengthen a little ; but it is a mere trifle.

One or two points I must not forget to direct attention to. Notice that the reeds in the *Sheng* have their faces turned to the wall of the bowl, and in this way a reflecting surface acts to the advantage of the reed ; the air also acts less wildly than might be the case if the reeds were turned toward the centre of the bowl. The reed tongues are very thin, and are not lifted from the level of the plates ; consequently they may be caused to sound both by drawing with the breath and by blowing, although the latter is prohibited in practice, as the moisture from blowing condensing on the reed alters the pitch, and corrodes the metal. Any excessive forcing of the tone the reeds are not liable to, because the air is passing at the same time through all the pipes, those that are sounding and those that are not.

Fairly, then, I think that I may claim to have transformed myself into an early Chinaman, and to have shown that I possess a sympathetic, inquisitive, barbarian sort of a mind, and ought to have lived years ago. The plan that I hit upon in a wild, instinctive way appears to be identical with the plan upon which the *Sheng* was evolved ; for no other seems so easy and natural as this, alike in regard to the origin of the instrument and to the development of the music.

CHAPTER XVII.

In the Land of Siam.

THE SIAMESE "PHAN."

Geographically the three empires of China, Japan and Siam, may be considered as one region, and therefore, without doubt the *Sheng*, the *Sho*, and the *Phan* have a common origin; and within the confines of these lands this kind of instrument has its home. There is no other type of the free reed, nor does it seem to have strayed beyond its home until after the lapse of many centuries—how many we cannot with any certainty say. Somewhere in the land of China the free reed had its origin; the first instance, too, of the employment of metal as a vibrating tongue to produce musical sound; and, as I said, the reed stamped out in metal was bound to be a free reed. Yet it is curious that no other nation had for music a metal reed, when we note that, as Mr. W. St. Chad Boscawen has stated, the working of metal had been practised as early as 3000 B.C. in Chaldea. He tells us of earliest Chaldean inscriptions being certainly as ancient as 4000 to 5000 B.C., and that one of our earliest Chaldean sculptures

contained a representation of the harp and the pipes which were attributed to Jubal. The last half dozen lines are a repetition from the first chapter, merely because it is desirable to have the facts they set forth born in mind in this part of the exposition also.

The instrument here illustrated, the Siamese *Phan*, is of the same family as the Chinese *Sheng* and the Japanese *Sho*. The principle is the same as regards the production of sounds in each instrument. Although the *Phan* in appearance is so different, yet details of its construction are the same,—viz., a collection of bamboo tubes forming a related series of pipes for a succession of musical sounds; a bowl into which these pipes are inserted, the bowl having an aperture for breathing purposes; and each pipe possessing a little free reed cut in a plate metal, and the sounds of the pipes only to be elicited when a small lateral aperture at the side of each pipe is closed by the finger of the player. The pipes are also slotted, and are of superfluous length, so much so that one is at a loss to account for the purpose or the advantage supposed to be derived from the excessive length; in fact, the illustration does not show the length to which some of the bamboos actually extend. The Siamese may be able to give a reason, but we are not; and the instrument being rarely found in this country, there are no facilities for investigation of the musical effects.

The instrument is apparently a rude survival of an early period when China alone was the civilising influence upon the natives of Siam; the little free reeds used presume access to an already established industry in the working of metals, and may have been obtained by the natives by way of barter.

The Siamese Phan

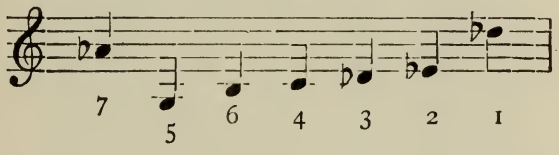
Mouthpiece

Fig 31

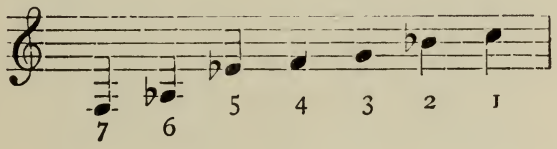
An instrument in the Brussels Museum of Musical Instruments is described by Mr. Victor Mahillon, and the scale is set out as below. The tubes are fourteen in number, fixed in two parallel rows of seven, as will be seen ; and upon the right hand is the flat face of the bowl where the player places his mouth, and inspires the air from the interior, setting the reeds in motion in any of the pipes the lateral hole whereof shall have been closed. These are the notes :—

Scale of the Phan.

Pipes to the left hand of orifice of bowl :—



To the right hand :—



Notice the prominent relation of the fourth ♭*a*, ♭*d*, and that there are two notes alike,—♭*e*. These would, I expect, if tested, prove to be slightly different, so that one might be a true fourth to ♭*a* above, and the other a true fourth to ♭*b* below ; each derived by a different progression, in the way that I have pointed out in the evolution of the *Sheng*.

The Phan belongs to the same family as the *Sheng*, and it is for that reason only that it has been brought to notice here.

CHAPTER XVIII.

In the Land of Japan.

JAPANESE PITCH PIPES AND THE JAPANESE CLARIONET AND THE SHO.

The Japanese are a curious people, blending as they do in their manners and customs, in their ways of thought and mental tendencies, in their childish acceptances and intellectual eagerness, naive simplicity and artistic perceptivity; a strange union of the primitive, the ancient, and the modern, all instinct with present vitality. In their musical system and musical practice, they inherit a long past, prehistoric; and, in their way upward through the centuries, seem to have developed an absorbing power, enabling them to acquire the new without foregoing the ancient, and to blend all that they acquire with a spontaneous ease that is less art than happy nature, making in every sense the best of everything. Adhering to the traditional, yet unfettered by the pedantic formality which so cripples the progress of the Chinese, they are able to advance with freedom,

and to affiliate whatever seems to them good. In the Japanese musical system, we find the ancient pentatonic scale, the old Greek scales, and the equal semitonal division of the octave, all coexisting; the latter being to them indistinguishable from our equal temperament,

Japanese Pitch Pipes. Full Size.

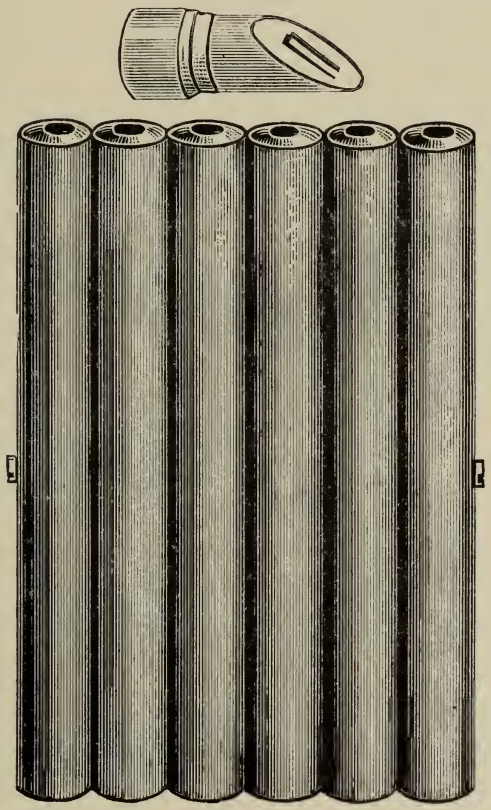


Fig 32.

which we assume to be so modern. Hence our pianoforte is naturally acceptable to them for its progression of scale, although their ears do not yet make the demand for harmony which is characteristic of the western nations.

The illustration given is full size. It is of a set of Japanese pitch pipes, consisting of six little bamboo tubes, threaded at the middle on a copper wire, which, merely flattened at the ends, serves to hold all the pipes together. At each end of each pipe is a little hollow plug, which fits in tightly; and at the point which is cut on the slant a small brass plate is fixed, as shown in the sketch at top, which is drawn twice the size of the original; and in the middle of the plate is a tiny reed, cut in the plate by a fine chisel. This reed lifts up its tip in a fine delicate curve, like the curve of "my ladye's eyelash"; and each of these minute hairlike reeds is formed to give the desired pitch for one of the twelve semitones of the compass of the octave. To obtain exactness, the tips of some of the reeds have a tiny bit of beeswax, loading them to the degree of the slower movement of vibration which the artist's ear demands.

The plate itself is fixed on the point of the bamboo plug by beeswax,—nothing more; so simple and efficient is this primitive construction, yet answering every purpose of the musician. At the twelve ends are the names of the notes in gold, stamped in Japanese characters; but these the engraver has not attempted, lest unknowingly some bend or twist or dot might be such as to give some signification not fit for ears polite: for we are aware in our own language how the omission or insertion of a single vowel may alter the whole meaning and be a source of lamentable error. The pipes turn on the copper rod, permitting either end of each pipe to be brought round to the lips as wanted. The reeds only sound by suction: you draw the breath through, and that sets the reed vibrating and sounding,

whilst the note on an instrument is being tuned. To blow through on to the reeds would horrify the native musician, because the moisture of the breath would lodge and injure the durability of the reed. To have a set of pipes as these, is as it would be to us if we had a dozen tuning forks in a case to tune our pianos by for ourselves. All the stringed instruments in Japan require to be properly tuned every time they are played; so one can appreciate the utility of this pretty little companion in its simple case, and dagger fastening all complete for the pocket. Or, as one should say, for the sleeve; since it is the sleeve that is the receptacle for all the odds and ends, the impedimenta, which civilization carries with it in every land.

The scale as nearly as we can represent it is:—

A Sharp Fourth.

D, E♭, E, F♯, G, G♯, A♭, A, B♭, B, C, C♯.

A Flat Fourth.

We must not look at these as we do at our fourths and fifths. The intention in the scale is that the player, according as he is going *up or down*, should by *some traditional rule* be able to substitute a sharp interval for a flat one. Thus, he takes in the course of his melody a flat fourth D to G, or by taking G♯ gets a sharp fourth; or again a flat fifth from C♯ down to G; and the flat fourth B down to to F♯ seems a favourite essential interval. We should remember that the harmony or concord is confined to octaves, fourths and fifths, and that, the tones of the instruments being faint and quickly vanishing, a mistuned fourth or fifth is little worse than perfect intervals. The sharp thirds are not

unpleasant, but have a peculiar breezy effect heard upon the *Sheng*, and the Sho.

There is a great tendency in Eastern scales to make flat fourths and sharp fifths. This same flat fourth is given by my set of Chinese bells, and I remember how Sir F. Gore Ouseley caught it instantly when he heard it. He had the keenest ear for pitch that I ever met. The A and A♭ depart from our relation of pitch. But the Japanese are so accustomed to freedom in altering their scales that the *Koto*, though tuned accurately, is during playing altered to the passing fancy of the player, who is allowed to pull the strings below the bridge or to press them just as the moment dictates, sharpening or flattening any interval. The classical scales used in religious and royal ceremonials and the popular scales are quite distinct, which shows how in course of time the music itself has changed.

My bells above named give F♯, A, B, C♯; the F♯ to C♯ making a fifth, the F♯ to B making a flat fourth, the A to C♯ a sharp major third. We may reckon bells to be true carriers of pitch, scarcely, if anything, affected by age.

Mr. A. J. Ellis traces the old Greek tetrachords in the Japanese scales, and remarks upon one, "it is interesting to observe that this *hiradio-shi* scale, which consists of a tone and two conjunct tetrachords, each divided approximately into a semitone and its defect from a fourth, presents us with a survival of the oldest Greek tetrachord. Perhaps Olympos himself tuned no better than the Japanese musician I heard." He also infers that the pentatonic scale was later than that of the tetrachord. He says "that China and Japan introduced nothing new beyond the original limitation of the scale

to five notes, which arose in fact from divisions of tetrachords *into two parts only*. For instance, a semitone and major third, like those of Olympos (whose very division we find in the popular music of Japan), or else into a tone and a minor third ; the thirds arising in each case as defects of the first interval of a fourth. Such tetrachords were then either conjunct or disjunct ; but they were always capable of being completed into Greek scales, as has been actually done in Japan and China. On the other hand, Japan at least, and China also, have attained a system of twelve more or less exact equal semitones."

The Japanese have twelve semitones to the octave, as the Chinese have, the root of their civilization being the same. But in music ancient equal temperament and modern equal temperament are not quite the same thing ; nevertheless, the approachments come very near. The scale, however, is not used to play music proceeding by semitones, but is used for the purpose of transposition of melody to high or low position, which changes never trespass beyond a range of fourteen sounds for such melody. Our necessity for equal temperament arose in like manner from the desire for transposition, but it was for the needs of harmony. This distinction we should never forget when considering Eastern systems of music. Moreover, our modern method of counting from the low note upwards seems to be an inversion of the more primitive method, which proceeded from above downward. Hence when the fourth below was taken it has been our custom to assume that the note was obtained as a fifth upwards from the octave note below, and much confusion of interpretation has resulted therefrom. There is a

significant passage in Mr. A. J. Ellis's notes to Helmholtz:

> The fact that the Greek scale was derived from the tetrachord or divisions of the fourth, and *not* the fifth, leads me to suppose that the tuning was founded on the fourth, not the fifth. . . . . It is most convenient for modern habits of thought to consider the series as one of fifths; but I wish to draw attention to the fact that in all probability it was historically a series of fourths.

I often had arguments with Mr. Ellis upon these points, and after the study of Arabic and Persian scales for his comparative examination of "The Musical Scales of Various Nations" he came at last to the same conclusion. The fourth always seemed to me the most naturally selected interval for the origin of the primitive scales. It prevails in Arabia, Persia, China, and the East generally.

The instrument which is here illustrated is Japanese, and is called a clarinet on account of the similarity in the relation of its sounds, its second series being 12ths, not octaves. The most noticeable peculiarity of the little instrument is its reed, which is as broad as the tip of our bassoon reed; but unlike that, is broader at the bass end, which is inserted in the pipe (as you will understand by the drawing, which shows the reed cut through at mid-section).

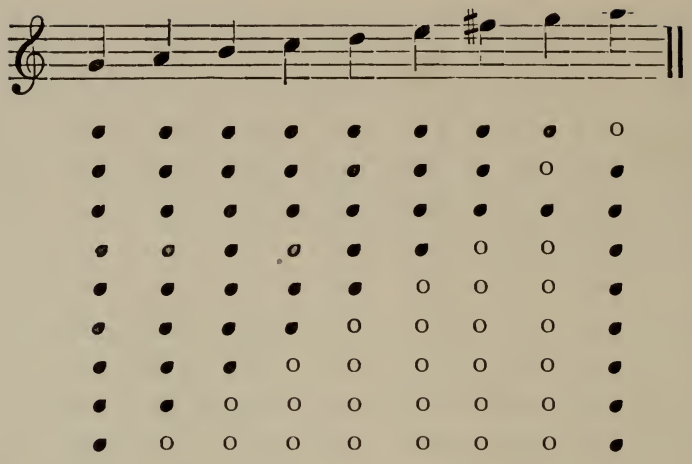
The vibrating portion is at the tip, to the extent downward of three eighths of an inch, which evidently has been pinched together and then dried in some particular way. The two lips from the centre expand outwardly under moisture, and leave a fine ovate opening, which, under the suction of the passing stream of air closes, and then reopens by its own elasticity. The reed does not consist of two separate parts bound to-

gether, but is itself tubular, its diameter at the bottom being three eighths of an inch.

Then a little clip of cane with bound ends forms a ligature to keep the lips of the reed in proper relation during blowing; and as it is pressed down tightly or loosely, affects in some degree the pitch. Also the lower end of the reed is bound with a strip of soft paper, where it fits into the pipe; and so, whether it is allowed to be set far into the pipe or not, will likewise affect the pitch considerably. This will account for some discrepancies in the statements as to the normal pitch of the *Hichi-riki*. Again, in China, the same kind of instrument is found differing in length, and having the name *Kwan-tze*. The Japanese instrument is no doubt a refined copy of the Chinese model, which itself is so ancient that it may have been brought from some region of the Cancasus. My own instrument measures in pipe length 8in., and with the reed fitted in, $9\frac{1}{8}$in. In the Brussels Museum, one is noted which is $8\frac{5}{8}$in. in pipe length, and the lowest note is F; but this instrument has another thumb hole between the third and fourth holes in addition to the hole which appears in my pipe between the sixth and seventh hole.

The pipe also, it should be remarked, is not cylindrical, but in a musical sense is more so; since, by its being a cone inverted, the flattening influence of form on the pitch is increased. As it was in the old German flute, which, like this, was an inverted cone, and so conduced to the better production of the lowest notes.

The scale of the *Hichi-riki*, on the authority of the Musical Institute of Tokio, is given with the following tablature:—



The open pipe length for the lowest note would therefore be twice the length of this pipe, so we say that the *Hichi-riki* speaks double depth tone. And when blown with higher pressure, the first series of harmonics is not one of octaves, but of twelfths. An interesting circumstance is that when a smaller reed such as we use for the oboe is inserted, then the tone leaps a fourth (not an octave) higher, and its harmonic series is one of octave relation; in fact, it is the original twelfth acting, slightly modified by being elicited by a smaller reed, and hence emphasizing the compound nature of results from pipe and reed associated. With one reed, I remember that the pipe rose a fifth, its twelfth being then really transfigured only, yet becoming its octave, being, as elicited, the same note.

Another curious fact connected with the *Hichi-riki* is that—if the upper end of the pipe is placed full within the mouth, and is blown through without any reed whatever, and without any action of the lips—clear and powerful notes are elicited, varied as the

openings of the holes are varied ; provided one of the upper holes is left open. Then the pitch of the issuing notes corresponds to such as are calculated according to the length between the distant holes as an open pipe length. It is, further, indifferent whether the end of wide diameter or that of narrow diameter is taken into the mouth ; either way sounds are readily produced. The upper finger hole thus corresponds to the twelfth hole in the clarionet—according to the argument upon this question in a previous chapter—and the length of pipe above it is to be disregarded.

Within my knowledge there is no other pipe instrument that, blown through, will produce sound in this fashion with no visible vibrating agent. It appears reasonable to estimate that the air issuing from the upper hole takes upon itself the vibratory action of a reed or lamina ; and very likely the shape of the hole (which is a long oval), and the thinness of the substance of the tube (which is cane or bamboo), may both be favourable to such action. The instrument is very simple, yet it is of beautifully finished workmanship, and is altogether curious and interesting.

This illustration shows the cap of the reed of the *Hichi-riki* separately. The cap is merely a piece of soft wood very deftly hollowed to fit the reed, and the curves of the opening will show you the shape that is presented by the tip of the reed which the cap is intended to preserve. The two lips have during playing absorbed moisture, and have expanded to the shape shown in these curves ; but immediately after playing the cap is placed on the tips, and then these lips in drying set together in a pressed form, as two straight lines closely adhering, again taking the curvature

This oval indicates the thumbhole at the back.

Clarion of the Japanese, called the Hichi-riki.

Cap of Reed.

Section of the Reed.

Fig. 33.

as soon as moistened. We often find reed instruments with caps and covers, but rarely I think fulfilling this office of preserving the form in suitable state in which the reed is best left to dry gradually. The caps upon the old cromornes, pibgorns, and stockpipes, although they tended to preserve the reeds, were otherwise different in purpose, being used to convey air to the reed, which was not placed in the mouth. Compared with modern instruments, these Japanese instruments are very simple; but there is a wonderful sense of fitness about the arrangements, and the workmanlike finish of the instruments makes the handling of them delightful.

Three reeds are provided for each pipe, and the reeds are each differently cut at the tip; one being cut straight at the edge, another with curved margin, another almost semicircular; the object being to cause variety in the quality of tone,—one being suited for songs of martial character, another for dance, another for songs of love.

It is noteworthy that the oval hole is preferred by eastern peoples. The Greek *auloi* preserved in the British Museum possess oval holes, as do the pipes of Egypt, the *arghool* pipes, the Lady Maket pipes; and in truth the oval is the form naturally derived by cutting upon a circular surface, and it is also well adapted to the fingers; nothing but a formality for elaborating could have induced the modern habit of making round holes. Primitive instruments were often so played as that the holes were covered, not by the tips of the fingers but by the fleshy part of the second joint of the finger, as may be seen at the present day among the rural population of Italy and Spain. In the grand

work on Egypt (fifteen folio volumes) published by order of Napoleon the First, this same instrument is depicted full size, with section of reed and all details, and is given as a native Egyptian instrument.

From a recent publication by "The Egypt Exploration Fund" I find that a six-holed pipe has been discovered in a temple in Egypt (Diosopolis Parva), made from the horn of some small deer, and very possibly was of this kind, although from the imperfect state of the mouthpiece we cannot say for certain, and this pipe is as old as about 1500 B.C. The photograph of it shows the same peculiarity of form of tube, the lower end being of the smaller diameter, and the indications to the expert eye are that a reed set up the vibrations. So the type is undoubtedly Egyptian, and we see how natural it was to derive the inverted cone form of tube from the adaptation of the horn.

At the same time it would accord with the view I have taken of the common source of origin of the Chinese and Egyptians, to consider this instrument to have been developed by the Egyptians independently, and the Chinese to have developed theirs, alike from some prototype common to both at an early prehistoric era.

The Japanese seem to have carried the workmanship of their instruments to a higher degree of refinement than the Chinese, and to have a much keener musical perception, and a sense of the fitness and relation of things in art and mechanism.

You will remember that in describing the reeds of the Japanese pitch pipes, I likened the delicate upward bend of the dainty little reeds to the curve of my ladye's eyelashes ; well, I can find no truer similitude,

and you would say so if you saw them,—the reeds, I mean, not the eyelashes, which must be left to imagination. The practical purport of the device is what I would have you notice, because it shows the intuitive sense of fitness which guided the designer; for the tongue is so curved upward that it will not reverse and bend the opposite way as the flat reed does. Thus it is secure against fluctuations of pitch, a very requisite provision, since in this case each pipe is designed to be sounded alone, and is subjected to the full force of whatever suction may be brought to bear upon it. A small reed of straight tongue could not be relied upon for pitch under such a stress: hence experience taught the designer by a happy device how to secure the end he had in view.

In Japan, we find the *Sho*, which is there a national instrument, is practically the same as the *Sheng*, only differing in that two of the mute pipes are made available to extend the scale, and that there is a little humouring in the pitch, probably from a familiarity with modern equal temperament; because this is, after all, only a reversion to a system with which scholastically their teachers were well acquainted in theory.

The *Sho* maintains its traditional office in ritual and in ceremonial affairs, and its scale, with little differences, is the same as that of the *Sheng*: hence we may infer that the tunes in use, which have been handed down from a very early date, are common to both.

The Japanese recognise in their music two systems, the classical and the popular, and these are in everyday use. The scales are essentially traditional, and are kept quite distinct. In the main they are Chinese, as also are the instruments; yet there is a strange mingling

of the ancient and the modern in everything connected with the Japanese. In art, the Japanese are undoubtedly superior to the Chinese ; the *Sho* that I once had and gave to a friend was most beautifully made, and in every particular delightfully finished. A large Japanese *Koto*, a thirteen stringed instrument that I possess, is a marvel of beauty, with lovely lac pictures running along the sides, and inlays of ivory and tortoiseshell and variegated woods in thousands of pieces, silver bosses, bronze dragons, and silk tassels, altogether a delight to the eye. The *Koto* of Japan, though carried to more artistic perfection, is the same in construction as the musical instrument called the *Sê* in China, and will be found further described in the section given to the Chinese Kin, the favourite of Confucius.

The Japanese have several other instruments both of the wind and string classes, but only those which I have introduced seem tributary to the purpose of this treatise.

CHAPTER XIX.

In Ancient China.

CEREMONIAL INSTRUMENTS.

Bells, Chimes and Gongs are held in high esteem by the Chinese, they are indispensable in their Ceremonies and Ritual, in their Festivities, national and social. So ancient is their use that the order of their coming into existence, or the date of origin are mythical, each kind of instrument seems equally old, still they had to be accounted for in Chinese logic of history.

One of the most curious traits in the character of the human animal is an unfeigned delight in super-exaggerated noise. Other animals are affrighted at noise, but the human animal makes a deliberate orgie of noise as a special means by arrangement for obtaining a sensual satisfaction of the ear. Amongst savage tribes and barbarous nations, and amongst nations emerged from barbarism well banded in social communities, everywhere we find that this sheer delight in noise, called music, is manifest and on record. Not

merely called so, but dignified and accepted as music. 'Tis true that the Indian savage says his music is to frighten away devils and evil spirits, and the Chinaman tells us that his earsplitting distracting music is to make night horrible to the dragons threatening to devour the moon; but depend upon it, the devils and dragons are quite subsidiary to the main desire for indulgence in noise; and the excuse, we, perfectly well knowing the innate hypocrisy of the human animal, can complacently allow to pass. The love of noise belongs to us. Nature's gift—like the love of art for art's sake, is a love of noise for noise sake; it is only a change of phrase. We should not decry this, nor should we plume ourselves upon our civilization as freeing ourselves from this original taint of barbarism. I confess to thoroughly enjoying a thunderstorm, my nature is absorbed in an energy greater than the individual, and I revel in it. Man's love of power is the basis of such satisfaction.

Into this mood of meditation I was drawn the other evening after listening to Wagner's "Procession of the Gods." How the music takes hold of you, dips you in a sea of noise, and makes you feel alive all over. For this reason Wagner's grand music is grand,—is greater than you. Your whole frame is plunged into an elemental excitement to which every nerve fibre thrills, and you feel conscious that latent impulses native to your being are awakened into activity; the barbaric strain in us responds, and exalts us beyond our conventional state. Noise or music? Well, technically we make a distinction. Ask a casuist what is the difference between virtue and vice, and he will tell you it all depends,—one may be as bad as the other. So of

noise and music, one may be as bad as the other ; aye, even worse. By all accounts much music is ; but that may be prejudice. I have heard that some people decry Wagner's music as a saturnalia of hubbub and noise. But it has one redeeming folly,—it lives: hence the censors, being human, often live to pardon.

Our scientific definitions of noise and music serve the purpose of science, but the truth is that with nature noise and music are identical in origin. There is orderly noise and disorderly noise, and music is of the orderly kind,—that is all. Discording noise, undiscording noise. Milton understood this, writing of singing

With melodious noise,

and replying

With undiscording voice.

I want to emphasize this teaching, want to impress you with the conviction that all the excitement we are seeking in our most modern style of music is but a reversion to our original instinctive desire for a dynamical excitement,—not an excitement merely æsthetical and physical, but actually moving, forceful, elemental ; a true barbaric love of stir and thrill,—and rightly so. If you think, you will find in all our modern ways a tendency to this reversion to a belief in and a culture of our original instincts. The realism of the day is the expression of a desire to understand life as it is to the individual. The hideousness of a merely conglomerate community is making itself felt upon every plane of society, and the concurrent aspiration is to be more human.

Culture will one day exhaust the conventional, and

in music the tendency is apparent. The vast volume of choral sound we listen to stirs us with contagious emotion. Our pleasure in grand organs with their roll of diapasons and arresting challenge of trumpets and tubas; our willing yielding up of ourselves to be swayed hither and thither for hours in the power of the massive orchestra, that wonderful machine of nerves and muscles,—what does it mean? It is all dynamical, all barbaric. It is not only the ear that is concerned in listening, the whole being is under strain and stress. Do I hence imply that it is wrong, is reprehensible so to employ music? By no means. The moral of it is that the strong innate tendencies of our nature are best recognized, and used; nay, that they will be, will force themselves to the surface, and that under culture we may train them to our advantage. For civilization must go forward, is not content to-day with that which contented it yesterday. The appetite grows by that it feeds on; more and more we ask for intensity of excitement.

A scientific writer of an earlier generation, I think it was Leslie, defined the ear as an organ of touch, which we now under the evolutionary investigation of development understand it to be; and this is what I would have you recognise, that sound is able *to touch us*, able to awaken a net-work of nerve organization, to make the lip tense, to cause the eyelids to quiver and the heart to throb; the breath to come and go in accord with the aërial pulsations,—as a hand that is laid upon us to arrest or to exalt, to invigorate or to soothe. *Hearing* is an exalted *feeling*.

The Chinese, long before Englishmen existed, found delight in the dynamical influences of great sounds.

Their largest and most potent sources of music were bells and chimes, gongs and drums. These supplied them with that excitement which is afforded us by the masses of sound from our large orchestras and grand organs. We say that their music is nothing more than deafening noise. They say that our music is no music; it is bad noise. So it is only matter of choice how you shall be stimulated. It's all the same,—opium or whisky: purely a racial question.

Very early the Chinese attained great skill in the making of bells; and it may be that among these people the art of Bell Founding originated, and from the east extended over Europe. Bells are particularly associated with religious ceremonials in all countries, and have generally superstitious credentials. The Chinese frighten dragons with them; and the Christians exorcise devils with them. The Russians, who bridge the earth between Europe and China, are especially reverential to bells. The great bell at the Kremlin, Moscow—over 21ft. in height and 67ft. in circumference—is world famous, as we have known since we were boys.

The inevitable *Ling Lun* was ordered to cast twelve bells to correspond to the twelve *lus*. Metal, the Chinese say, is one of the five elements, and necessarily has its place in music. The bell metal is composed of six parts of copper and one of tin. When melting, the alloy appears to be of an impure dark colour, soon changing into a yellowish white, which gradually passes to a greenish white, and when this last has become green the metal is ready for pouring into the mould. There is in the South Kensington Museum a large and very handsome bell from a Japanese Budd-

hist temple, which is a fine example of the colour desired. The bells have not clappers, but are struck with wooden mallets.

Smaller bells, however, have clappers, and the little "*Fêng-ling*" or "wind-bells," which hang at the eaves of houses and pagodas, are ingeniously contrived to secure effect, light silk ribbon streamers being attached to their clappers so that the softest breezes awakened the sweet sounds. The wind-bells were often hung in halls and corridors for sake of these effects.

Bells of all sizes, from those weighing fifty tons down to the small ones which swing on the eaves of pagodas, used to be found all over China. Some are ornamented with characters, some with designs and symbols; some are round, some are square; and all are mainly used for religious purposes. At the door of each Buddhist temple a bell is seen which the believers on entering strike "to call the attention of the sleeping gods."

The most ancient Chinese bells were quadrate in form. Bells belonged originally to the Confucian religion, but the Buddhists also adopted their use, and they are commonly to be found in the temples of both. At the temple of Confucius is a great bell which the Chinese say is made to correspond with the very big drum; the one is not used without the other, for the drum had to give the signal to begin, and the bell had to announce the end of the hymn at the ceremonies. This bell is called the *Yung Chung*. There is another suspended upon a single frame, which has to give the note at the beginning of each verse in order "to manifest the sound" or give the pitch. This bell is called the *Po Chung*, and is here illustrated. The shape, as will be noticed, differs from that of modern bells.

The Chinese Po-Chung.

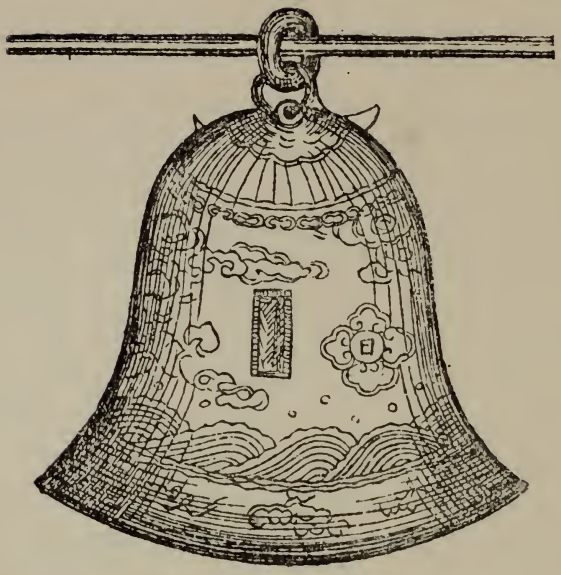


Fig. 34.

All their bells are cast to produce a sound definite in pitch, and in their sets of smaller bells and gongs the primitive scale of sounds and its successive order was intended to be kept to so far as the means at command enabled them to secure accuracy, or as near as ceremonial usage required them to be—for with these people ceremonial is religion.

The next illustration is of the *Yung-lo* or "gong chimes," composed of ten little gongs suspended upon a frame by silk cords. In making gongs the Chinese are marvellously expert, and specimens of the genuine ancient sort are highly prized here; the tone has a richness and endurance which moderns fail to equal, These little gongs are all of the same diameter, but

The Yung-lo or Gong Chimes

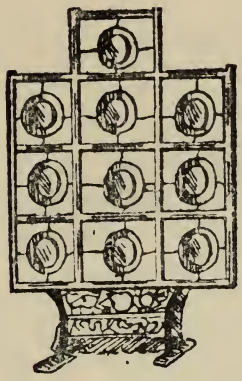


Fig. 35.

differ in thickness. The *Yung-lo* is used at court, mainly on joyful occasions. The larged sized gongs—sometimes they are two feet in diameter—are remarkably fine, and are very generally in use in processions and at various social functions, as well as in temples to waken the gods. He must be a rare sleeper who would be deaf to such a call.

CHAPTER XX.

In Ancient China.

THE FLUTES OF THE CHINESE.

Flutes I hold to be without doubt the earliest of wind instruments. They are found all over the world; no race however ancient, no tribe however rude, but possesses some instrument of this class. And if we may credit some stated example in museums, they may belong to the prehistoric age, the bones of bird or beast being adapted by man to whistling or fluting. There are two distinct styles common to flutes: the one is blown at the end, and is of the sort we use and call pipes or whistles; and the other is blown across a side hole near a closed end, and is with us the flute proper, or *flûte traversière*. But in addition to these, the Chinese have a flute which is quite unique, being an open tube, blown across centrally.

Given a land where river reeds are to be found, or a land where the bamboo flourishes, and we need no myths of origin nor tales of inventions to be assured

that savage man would by observation of nature be led to convert the tubes to the purpose of producing sounds ; and the gradual development from a simple pipe to one with additional side holes would in process of time be unavoidable. Travellers tell us that in the bamboo forests the rushing wind makes a wild music as it passes the stems of broken bamboos. The Pan's pipes might well have been in its earliest form a collection of such broken tubes. Here up to this stage, therefore, nature was the guide. The Chinese were, it is said long in making the advance to the next stage,—that of cutting or piercing holes, to obtain more sounds from one tube by temporarily closing two or more holes. The first step counts for much ; and with most races a long period may have elapsed before this step was taken, inevitable as it was.

Indeed the change from the use of two fingers of each hand to the use of three fingers must be regarded as a very significant advance. A long stretch of time was doubtless necessary before a pipe of six holes took a position in musical performance or supplanted the four holed pipe, for it could not be otherwise than an educational advance.

The bamboo is ranked by the Chinese as a product of special class, being neither tree nor plant ; but intermediate by nature, and of peculiar value to human wants. Hence the bamboo occupies one of the divisions in their scheme of natural sonorous bodies, and in music is dedicated to flutes ; although often flutes are made of marble, of jadestone, and of copper.

The dancers' flute (called the *Yueh*) was a short flut e and probably one of the most ancient. It had but three holes, recalling our flute of European usage,

which was played accompanied with the tabor for dancing, and for marking time by rhythm. At present this Chinese flute is but a rudimentary survival, being held as a stick or *bâton* for directing the movements of the dancers. There is a shepherd's flute *Ch-iang-ti,* and one *Heng-ti ;* both blown traversely. The *Hsiao,* said to have been invented by Yeh Chung during the Han dynasty, is a flute of dark brown bamboo, about twenty inches in length, having five holes on the upper surface and one at the back. The use of this is now restricted to ritual music, being played at the Confucian ceremonies on the "Moon Terrace," six being played simultaneously. There are various flutes with four, five, seven, or eight holes, both for popular and for ritual use.

The most popular of flutes is the *Ti-tzu* ; it is bound with several rings of waxed silk to preserve the bamboo from splitting. It has eight holes, one for embouchure, six for the fingers, and one covered with a thin membrane peeled off the interior of reeds ; this membrane, like that which our recorder flute had, is intended to give a particular character to the tone ; and it is curious how often we find such an adaptation, although in our modern custom quite obsolete. The *Ti-tzu* is frequently ornamented with long silk tassels when possessed by the wealthy people. It is used alike in theatrical performances, in funeral and in marriage processions, and is indispensable to every Chinese orchestra.

The Dragon flutes, ornamented with a dragon's head and tail, are essentially for ritual service, and not permitted for ordinary use. The illustration shows the awe inspiring aspect of these instruments.

The Chinese Dragon Flute.

Fig. 36.

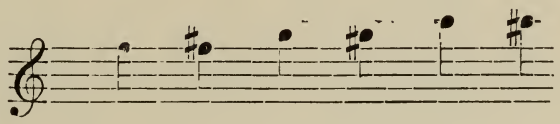
Pictures of the Chinese show performers playing upon flutes with an embouchure at the middle of the length, and with holes both to the right and left of the

embouchure. This flute is peculiar to the Chinese, and was described by Father Amiot. But, though the appearance of the style is maintained, the integrity of the instrument is seldom adhered to; so that it had come to be a doubt whether such a flute was playable, or even had been actually observed by Father Amiot. For, in modern hands, a plug near the middle converted it into a double ended flute of the ordinary method of playing only requiring a few holes in addition. M. J. A. Van Aalst names this flute *Ch-ih;* says that the number of holes varies from six to ten, and even more. But M. Victor C. Mahillon, describing more elaborately the ancient instrument, names it *Hwang-chông-tché,* and reproduces a description of it given by Prince Tsai-Yu, in 1596; and to this I am indebted for details, and also for the illustration, which I copy from that by M. Victor Mahillon in his most interesting catalogue of the Brussels Museum of Musical Instruments.

I remember seeing one of these flutes at the Chinese Court at the Fisheries or other of the Kensington exhibitions years ago, and wondered, much perplexed, how the playing was to be accomplished. If my memory serves, there is a specimen now at the South Kensington Museum; though for all practical enquiry, many instruments might as well be absent, there being no sufficient light to enable the visitor to see what he is in quest of in that department either by night or day.

Prince Tsai-Yu states that this flute is very difficult to play; which would account for its neglect, so that now the playing is a lost art. He says that it was constantly in use during the period of the three first dynasties (2205—1122 B.C.). It is fully described in "Tcheu-ly,"

an old volume treating of the ceremonial of the Tcheou during the rule of the dynasty occupying the throne of China in those early days. So that this instrument takes us back more than four thousand years. Its scale consists, according to M. Mahillon's investigation, of six equal tempered semitones:—



This curious flute necessitates a peculiar attitude on the part of the player. The flute is open all through; and, as you see, in order fairly to distribute his energies, the performer should place himself between the two ends, playing a scale by alternating the fingering, producing the notes in order, first from one hand and next from the other hand, according to the figures accompanying the illustration.

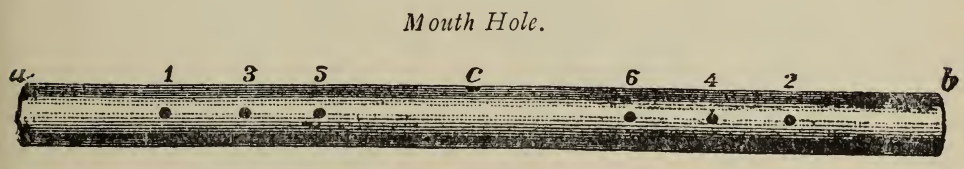


Fig. 37.
Chinese Flute. Hwang-chong-tche.

The instrument was constructed by M. Mahillon after the indications of the ancient writers, and found by him to be so exact in accordance with them, that he has no doubt that it was intended to be a standard of measurement for the pitch of the instruments provided by imperial decree for ceremonial use. The

circumference of this flute equals that of the coins bearing the imprint *Kai-Yuen*, and the length is that given by fourteen of these coins placed in line one beyond the other. The diameter of the coins inscribed *Kai-Yuen* is one thumb's breadth, ten of these being the length of the ancient Chinese foot measure, and consequently the length of the flute is one foot and four thumbs. The interior diameter of the tube is seven lines, and the embouchure is one half of that, whilst the lateral holes are again one half of diameter of embouchure. The question of dimensions is of great importance in respect of all matters of pitch; since the larger the embouchure the higher will be the degree of power exercised and acting upon the column of air in the interior of the tube, and consequently the sharper the pitch of tone elicited. So that for estimating a standard of pitch great accuracy in dimensions is of paramount necessity. The embouchure is placed precisely at the middle of the length. The holes marked 5 and 6 occupy points corresponding to one third of the length. Those, 3 and 4, are placed at one quarter the length, and 1 and 2 represent exactly one sixth of the length.

This picture is by a native artist. It is quite modern yet the archaic air about it seems at once to take us into an older world. The modernity of the artist is evident, he has represented a degenerated type of the flute "tche," not the ancient authentic. The white spaces are not intended for holes, they merely show the intervals between the rings of dark silk which are customary as preventing the bamboo from splitting. Correctly, the player should be shown with one hand to the right of the mouth and one to the left, the fingers

covering either side three holes. So you will have to imagine the still more curious picture that would have been presented by a Chinese performer in the olden time.

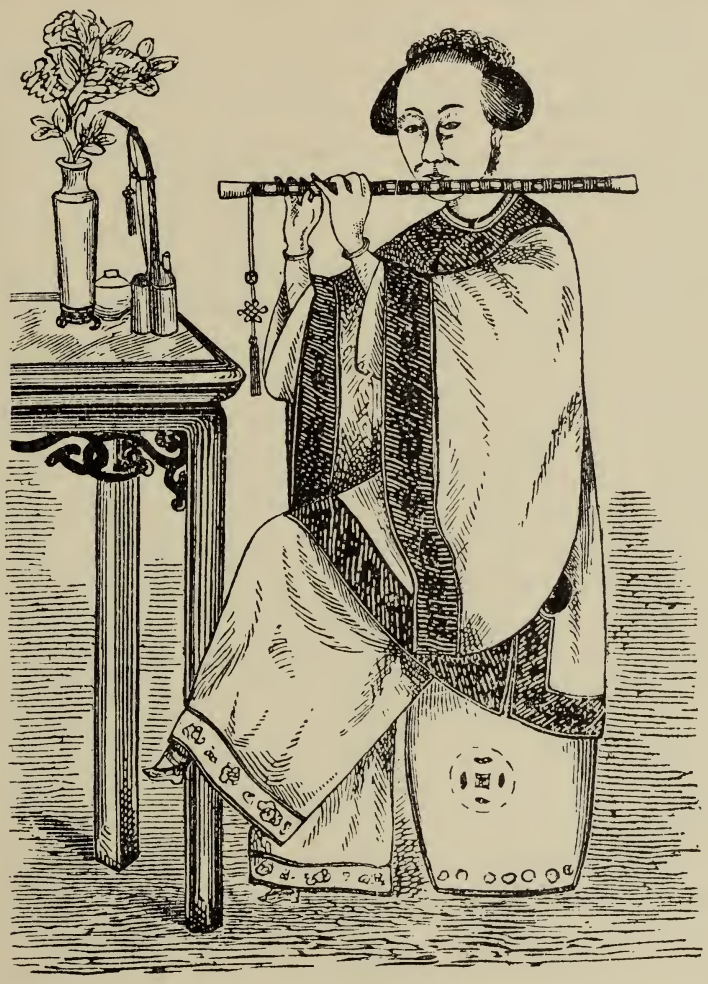
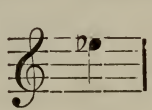


Fig. 38.

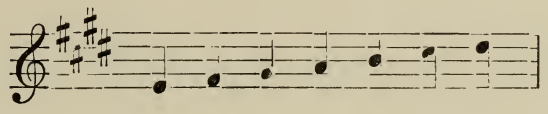
This symmetry in proportions is very remarkable and interesting. When the flute is blown across, with the six holes closed, a note is produced which was, es-

timated as *d*, but is really *e♭*; and when, in addition, the thumbs close the end orifices, then the note is an octave lower, nearly. Absolute precision we should not expect except from an expert Chinese player, as a different management of the lip may be an important factor in deciding the actual tone intended, and may differ as much from the European mode of management as the voices of the Chinese differ in character from those of Europeans. For, however exact in design such standards of pitch may be, experience teaches us that scientific exactitude in pitch can only be secured when the pressure of wind producing the note is weighed, as in our organ pipes. With lip blown flutes, when a certain pressure is exceeded, the pipe blows its octave and thus no doubt the player is warned, and custom enables him to restrain his breath to the correct force. The Chinese are wonderfully methodical in their systems, but they have not in these matters ever attained to the accuracy of practical scientific demonstration. It should be remarked that E♭  is the standard of pitch according to another pipe which was described by Amiot; and, as I have shown in my investigation, was the leading pitch note in the system of the *Sheng*. A pipe which I had made to the dimensions of that standard pipe, but made with organ pipe mouth, also gave the same note; and a fourth below that is the lowest in that scale.

The aforesaid standard pipe of the imperial archives is blown after another fashion. It is an open pipe, and is blown at one end in such a way that the lip of the player forms the base, corresponding to the languid in the organ pipe, a semi-oval or V shaped piece being cut

away from the end of the pipe, over which the stream of air is directed; the opening taking, in fact, the function of the mouth of the organ pipe. The mode of blowing is not altogether, or peculiarly, a Chinese method, for the Egyptian *Nay* may be considered an approach to similarity; but there is a little pipe found in Bolivia, in use among the Indian Quechas, which is exactly the counterpart of the Chinese *Lu* pipe as regards construction, and the mode of blowing is the same.

The little pipe is called the *Krena;* it is made of bamboo, and has six holes, the successive opening of which gives the notes following, the lowest being the end note of the pipe :—



The Krena.

Fig. 39.

Here is an illustration of the *Krena;* it is of one in the Brussels Museum. Being recently in the British Museum, I lighted upon an instrument on this principle, having two holes only, but in other respects the same; comes from Donga in the Niger region, and is called the *Lera.* The Japanese have a flute called the *Siakuhachi* which is of this nature, and is evidently traceable to the Chinese. The fact of a pipe cut in this particular fashion being adopted as the standard by authority for music, and for measures, indicates a very early usage for this kind of flute pipe; perhaps it came next in succession to the Pan's pipes. Indeed, I have seen some specimens of Pan's pipes, found with the people in the Malay Archipelago, which are double cut in this way.

The Rev. F. W. Galpin, the well-known enthusiastic collector of musical instruments, possesses some of this type obtained from Indian tribes of the North West of America, which I have heard him play as to the manner born. The wide diffusion of this type raises curious questions of the dispersion of races, as against that of a common instinct leading to similar development.

The *Tche* is undoubtedly an instrument concerning which, both practically and historically, a fuller knowledge is to be desired; it involves some curious acoustical problems which would form an interesting study. Certified as being one of the most ancient of Chinese musical instruments, it indicates that when it first was introduced a high degree of civilization must have been attained, and a very keen intelligence have been directed to musical problems, before so complete a system of relation of tones, and measurement of pipes, could have been worked out on a fixed method.

In the accounts received from travellers who attempt to estimate the scales and character of the native music heard by them, we are accustomed to find a prevalence of the minor mode always affirmed, and the statement is generally accepted as one based upon definite knowledge. It seems to be considered that the mournful and the plaintive in song and in music reflect the temperament of the people, and are its natural expression. I am inclined to question this; for I may doubt the keenness of the observer, doubt his musical capability of ear or mental power of analysis, may perceive a tendency of mind to take a stand on foregone conclusions, and may not be satisfied that the writer is competent upon the subject upon which he writes very positively.

Experience has shown me how frequently statements of this kind are not borne out by facts, although the statements have been made in perfect good faith. In this aspect there is a paper by J. F. Fillmore (an American author) which has a peculiar significance. He made a study of the music of the Indian tribes in America, having very special facilities for his work; and he also harmonised many of the melodies, with much satisfaction to the Indians. He says that,—

> In short, all melodic and harmonic resources to be found in our music, even the most modern and advanced, are also to be found in the primitive music of a people who have no musical notation, no theory of music, no systematized knowledge of it whatever.

And then at the end we have this *naïve* conclusion :—

> Long before the first week was over, all my preconceived notions of the significance of the incomplete scales, and of the importance of the plain major and minor chords as related to acoustic problems, had wholly disappeared.

The truth is that scales are so elusive that they may be read so as to mean anything a system maker desires, and such scrutiny is about as reliable as the reading of character and destiny by the systems of astrology and palmistry.

Chinese melodies are never definitely major or minor; are never intended to be so. The intervals are not the same as ours, and our notation does not express them with accuracy such as scientific analysis requires.

On the subject of the growth of scales my conclusions have been previously recorded, but I think that here, at the end of the pipe investigation, a brief repetition is desirable to impress the memory with the special view which is of importance to the musician's survey.

Whether in the east the tetrachord or the pentatone had priority in development cannot be determined, for it may well have been that both were developed independently; I favour the idea that the pentatonic is the rudest in character, and originated with the wilder tribes of the east in a very primitive era, whereas the tetrachord seems by its nature to accord with early pastoral life. I am only concerned with the question of scales from the instrumentalist's point of view; and I explain the prevalence of the pentatonic scale as growing out of the nature of the *instrument*,—first for the pipe there was one note, then there were two, and so on. Voices and pipes imitated one another, and the perception of the relation we call an octave seems to have been everywhere an instinctive perception.

I suppose it will generally be conceded that man is naturally lazy. Well, he will not exert his voice more than is necessary for his immediate purpose; so he takes more easily to the interval of the fourth, for to

rise to the fifth means greater effort. Place your fingers on a pipe; the spread is not equal, there is a marked enlargement of space between first and second fingers. If holes are cut to correspond with this finger difference, then the result is contrary to the pipe's need, for nature for equal tone interval wants the upper holes of the pipe to be nearer together; so the note turns out to be a tone and a half higher instead of the one tone distance. As with our keyboard, a long time passed before the thumb was brought into recognition to do finger work; so in the pipe, the use of the thumb was an after thought. Thus on the under side of the pipe a hole was introduced dividing equally or unequally this wide upper interval, itself forming another wide interval with the second note below; and in effect an overlapping arises in the pentatonic structure whereby the pentatone can be dissected into two tetrachords within the octave. Sometimes the distance of the first hole from the lower end of the pipe is greater, and makes the interval (a neuter third) appear at the beginning or end, according as we reckon the progression. In whatever way it may be, the pipe in the beginning made the scale.

There are many varieties of pentatonic construction, and the wide intervals may be in any position. Our best representative is found in the black keys of the pianoforte. We may commence on either F♯ or C♯, and thus vary the relations in progression of the scale.

A plaintive character in the music of native melodies is greatly due to the existence in the instrument of those imperfect intervals, the three-quarter tones, and the little leaps of tones that seem to fail to attain their aim, and never satisfy the listening ear of the European.

CHAPTER XXI.

In Ancient China.

THE FAVOURITE OF CONFUCIUS.

The stringed instruments which are of Chinese origin are but few in number, and they are not capable of producing any great volume of sound. They have several forms of guitar—a "balloon guitar," a "moon guitar," and an octagonal guitar. These possess four strings each, and are fitted with frets, and are struck either by the finger nail or by a plectrum. They have also a three stringed guitar with a long neck, but without frets. But compared with European instruments of the same class, they are poor and rude, both in tone and workmanship, and scarcely seem to have advanced beyond the primitive condition as to musical value. Similarly we notice their so-called violins, consisting of a bowl of some kind—half a cocoanut shell, or part of a gourd, or hollow piece of bamboo—to which a long bent neck is fitted, and with a drum kind of top of snake-skin covering the open bowl. The

bow used is little more than a bent stick, strung as a bow is for arrow shooting. In playing, it passes between the strings. Sometimes there are four strings, but the most popular instrument has only two, and is almost devoid of resonance. The wonder to us is how a people so ingenious should have left their most popularly used instruments without improvement in any direction. It is true that some little attempt at decoration is made, but there is no lavishing of skill, no lifting of the commonplace to the region of art.

Chinese Violin,

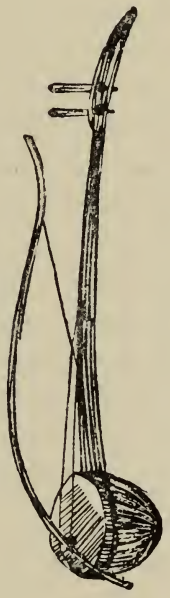


Fig. 40.

Very different, however, is the treatment of another class of instrument, represented by the *Ch'in* and the *Sê*. These are "many-stringed" and may be called oblong in shape, and many specimens are really beautiful in ornamentation. The art worker with illimitable

patience, bestows upon them the resources of industrial skill and the loving care of artistic designing in many coloured woods, and ivories and lac, and metal. Perhaps because these instruments are used in temples and palaces, and in the abodes of the great ones of the nation. The art of playing upon them is only acquired after the devotion of much time in learning "systems" overloaded with complicated directions, many of them associated with allegorical meanings, inattention to which would make the music of none effect, the "system" being as onerous as state etiquette.

The instruments described in an earlier chapter are classed by the Chinese—"the stone chime" as representative of Winter, and distinctively as stone, the first of sonorous bodies; and the "bell chime" as belonging to Autumn, and as the second of sonorous bodies, "metal." The stringed instruments do not come, as we should expect, under the heading, "wood," but are allotted to Summer, under the heading of "silk," because the silk strings are the sound producers, and silk is third in rank of natural productions. So you will see by this how very logical the Chinese are, notwithstanding the fantastic notions with which they embroider every kind of knowledge. The strings are made of many strands of silk, and the numbers of the strands to be dedicated to each particular string are stated to be subjected to written laws. Thus, the thickest string was to have 240 threads, and represented the sovereign; the second and fourth strings each to have 206 threads; and the third and fifth, 172 threads; and the reasons are given for such allotments according to poetical affinities and symbolical meanings. This essential formalism in the Chinese character has been the

hindrance to artistic, as it has been to the industrial, development in the nation; and yet, strange to say, the rigid injunctions which verbally still rule, are in practice, outside the circle of authority, only nominally regarded.

Instruments of the dulcimer class have wire strings, —brass or copper drawn very fine: but they—although good specimens are to be seen, some highly ornamented —are not considered national Chinese instruments, but as in some sense foreign intruders. The dulcimers are more related to Assyria, and in point of fact that land may be held to be their original home. Yet, as we shall see, there has been some intimate association with Assyria and Babylonia in very early times, for the instrument, the *Ch'in* or *Kin*, here illustrated, betrays in one particular feature a resemblance which can hardly be supposed to have arisen accidentally.

The *Ch'in*, or scholar's lute, is so called because it was the chief favourite of their great law giver, Confucius. In his time it was of great antiquity, and is frequently named in the classical works and in the annals of the first rulers of China. It was invented by Fu Hsi (2852, B.C.), and its name implies "restriction" or "prohibition," because "its influence checks the evil passions, rectifies the heart and guides the actions of the body." The dimensions, number of strings, the form, and whatever is connected with the instrument, had their principles in nature. Thus the *Ch'in* measured 3·66 ft., or $\frac{366}{10}$ of an inch, because the year contained a maximum of 366 days.

The number of the strings was five, to agree with the five elements. The upper part was round to represent the firmament. The bottom was flat to represent the

ground. The thirteen studs stood for the twelve moons, and the intercalary moon ; and so on.

In view of its design, it certainly, simple as it is, is a most perfect instrument, and its simplicity is its beauty. The upper surface, from end to end, is not round, but presents a hollow curve, being rounded only across. But as no bridges are employed in playing the instrument, this curve is finely laid, so that wherever the strings are pressed, they nowhere else touch, and are free to vibrate to the pluck of the finger. At the wide end, at the extreme length of the strings, there is a fixed bridge, generally for all the strings, which is of solid form, arched; behind it the strings pass through to the back, where they are attached to the drilled wood stems, from which long scarlet silk tassels depend. The strings do not conform to their primary limit ; some wise philosopher increased their number to seven.

The instrument which I possess has seven strings, and I have had it many years, as also had its former possessor ; and the nacre studs are arranged, not in the formal relation here depicted, but at distances corresponding to the half of the string, to two thirds, to three fourths, to four fifths, and so on. Any division of the string can, however, be made at the pleasure of the performer, these studs serving only as guides ; for the strings are tuned at will, and kept taut only by tying on two large pegs fixed in the back. The back, half an inch in thickness, seems to be of camphor wood, and it still sends forth its fragrance inherited from generations long ago.

Now comes a curious detail in the fitness of the instrument to its design, which I have not seen noted

The Ch'in or Kin

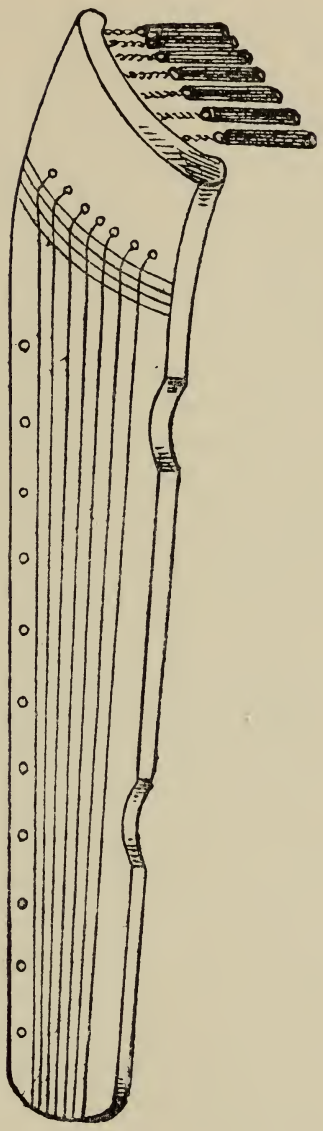


Fig. 41.

at all. The upper surface consists of thin wood, black japanned, and under this a layer of cork. It was a scholar's lute, for meditative hours, for no other hearers,

—the playing upon it being almost in the nature of religious exercise—secluded from the world, alone. This was Confucius's idea of its purpose, and it is the recorded tradition that he was so enraptured with its tones that he could neither eat nor drink; lovesick with melody, he lived for weeks shut up in his room listening to the music that had a voice for him alone, and spoke only under his own fingers.

I do not wonder that this was the favourite companion of Confucius, especially when I reflect that with this reverend teacher, as with Buddha, the mood of meditation was invited and sought for, as the highest exaltation of human being. When I have chanced to while away an hour questioning this instrument, I must confess to the fascination that it has, how it grows upon one in an atmosphere of silence,—

> It is so quiet there; a world apart
> Where none intrudes. Serenely we enclose
> A sanctuary, where in silence and repose
> The gentle flow of sound soothes the tired heart.

There is a certain weirdness in the low tones that seems to tell of depths beyond possibility of present experience; exciting a quiet longing, heard with a listening ear for something beyond, which has been left incomplete; full of mysterious breathing like the soft "susurrus" of the wind dreamily stirring the leaves of the forest. If I say it seems to suggest to me that I should like to hear a movement from one of Beethoven's symphonies or a Schubert's played upon a "consort" of these simple instruments, do not laugh—I really mean it; for the sounds, faint as they are, gather about them an infinite suggestiveness of the unattainable, which is the behest of the highest music to evoke in our nature.

We talk of "unheard music," and the cynic smiles; but we well know what we mean, and I say that this music of the sacred *Ch'in* is the nearest approach to,—indeed, takes us to the very borderland of—the unheard.

The *Sê* is a larger instrument, is in fact the largest stringed instrument in use among the Chinese, and had originally fifty strings. Tradition goes that a certain professional young lady was one day performing, and attracted the attention of the Emperor Huang Ti. The music impressed him so sorrowfully that he forthwith ordered the number to be reduced one half. A sensible ruler was Huang Ti. If we could reduce our sorrows and vexations by one half on the same principle, what a wonderful relief it would be; probably to the extent of halving the insanity of the country. So the *Sê* now in use has twenty-five strings, and these are divided amongst five colours; but instead of colouring the strings, they colour the bridges,—five blue, five red, five yellow, five white and five black. For although the *Sê*, like the *Ch'in*, is an instrument to be plucked, the strings are not subjected to pressure to bring them to playing pitch; but are lifted on to bridges, one for each string, which bridges the player places according to judgment, to determine the various vibrating lengths under demand. The bridges are placed in a general order, but have not a fixed position like frets, since the tension of the string at the times of playing can be, and is made variable; so each bridge is moved to the point that satisfies the ear as to the particular pitch required for each string. On removal of the bridges the strings are comparatively slack, at all events are safely lowered in tension.

Four kinds of *Sê* are in use, they differ only in size,

and in number of strings, the principle being the same; and it is customary that they should give the sound of two notes at the same time, generally octaves, so that on state occasions no doubt the effect is imposing, as the instruments possess considerable resonance. That which seems to be the most permanent variety has thirteen or fourteen strings only, quite sufficient for the modern skill and modern musical requirements. In this form it is preserved by the Japanese, with whom it is named the *Taki-Koto*. The example in my possession I have more than once made mention of, and recounted some of its beauties. Its breadth is 10in., its length 6ft. 4in., depth $1\frac{3}{4}$in. The wood is nearly half an inch thick, both the upper and the lower planks; there is no thinning of the wood, but the upper one is made to arch over in its breadth by having the under side of it fluted. This fluting process is marvellously well adapted for the end in view; the thickness of the sound-board, as we immediately recognize it, is the opposite of that which we pursue in stringed instruments. The wood is of a beautiful mellow brown, and is a riven plank. No plane has touched it; it remains as it was riven from the tree, showing as it were an embossed fibre,—so clear it is, and so purely natural. It has splendid resonance, remarked by every hearer for lovely quality of tone. A thick silk cord is laid upon the end-bearing bridge, and the strings set on this cord, so that the vibration is communicated only through the moveable bridges belonging to each string. At the ends of the cord are silk tassels of a quiet green colour, with some strands of pale buff intermixed: all in prefect harmony with the inlaid woods and ivories. The strings are plucked by the aid of two little ivory

plectra, shaped like a half filbert or almond, stayed upon the fingers by a narrow band of leather: thus the silk strings escape being affected by moisture.

The choice of thick wood intuitively by the Chinese is a lesson in acoustics for moderns. If we try woods of thickness with a tuning fork, the resonance obtained is often finer than any derived from thin cut pieces of the same.

The sonorousness of these large instruments marks by contrast the evident purpose of the designer of the *Ch'in* and concerning the latter there are yet some interesting particulars to mention to bring its nature clearly before those who have not had an example under hand.

We observe in old Chinese illustrations of the instrument that, for the time of playing, the *Ch'in* is placed upon a table, which it overlays, so that the tassels hang down. The instrument is not allowed to touch the table, but is supported on two soft pad rolls, so that no resonance may be communicated or be enhanced by contact with its surface. It is very remarkable, this layer of cork lining the upper surface, for I have never seen it mentioned that such was the construction. My usual curiosity prompted me to place my hand inside, and feel what the substance of the wood was, and by the yielding to the indentation of the finger nails I discovered that instead of being wood the material was cork; and a most admirable subduer it is. The consequence is that not only is the quality of tone most delicately soft, but it is devoid of that fringe of sound, that twang which accompanies the alliance of vibrations of wood with string when strings are plucked.

The case of my *Ch'in* has a painting in gold, showing

ladies playing the *Koto*. They are in the open air, seated on the ground and evidently having a merry time. One lady is singing, another playing, another listening, and an attendant is handing cups of tea. I cannot tell how old this case is, but I see that the head dresses of two of the ladies are precisely in the same fashion as the hats trimmed here in London. Truly the world moves in circles, and old things become new.

On grand days at the Confucian festivals, six *Ch'in* are used at the ceremonies of the temple, three on the east side of the hall and three on the west.

The *Ch'in*, though very easily played, is nevertheless a difficult instrument to learn according to the Chinese requirements, long study being necessary to master all the subtle distinctions which determine how the strings should be sounded; whether for a particular note a string should be plucked to the right or to the left, and which strings are allowed to be sounded together; and quite a vocabulary of instructions to learn, in order to be accomplished in an elegant style after the dictation of the pedants and guardians of the laws.

The strings were in ancient times tuned

c——*d*——*e*——*g*——*a*——*c*——*d*

They are said to be in the present day tuned

g——*a*——*c*——*d*——*e*——*g*——*a*

Whatever the tension of the strings, the little inlaid nacre studs serve to indicate the relative divisions. They guide the player but do not restrict him; since, if a string gets slack he can judge by ear how much difference to make in distance,—thus shortening the

sounding length in order to obtain the pitch required for conformity to the other strings. Also a firmer pressure on the string will raise the pitch, and the practice is resorted to by the player as an embellishment often desirable.

The strings are of silk, and are set at very low tension, and are merely pulled by the hand up to pitch and tied with an ordinary knot on to two pegs at the back on the left hand, four grouped to one peg and three to the other,—most primitive, but apparently quite satisfactory. On the right hand the strings are knotted on to thick green silk cords, each cord being threaded through a little drilled cylinder of wood in a manner effectually preventing slip. Each of these little drilled stems carries a scarlet silk tassel thirteen inches long. Consequently these little ornamental cylinders serve as hitch pins for the strings; the strings are first drawn, tightly bearing on these when set for playing, yet slack as regards tuning, and in that state may be left when unused, just as a violin needs to have its strings slackened when out of immediate use. Then each string is brought to tune by ear, the cylinder being pressed down to a right angle, at which it stays, clipping the string downwards a quarter of an inch, and thus increasing the tension to the degree that practice has determined to be required for playing. After playing, the cylinder can be tipped back to the slack position. Simple and ingenious, since silk strings, although waxed are, like those of gut, affected by atmospheric changes, against which some provision has to be made.

The tasselled end of the instrument, it should be observed, is placed to the right hand of the player.

Why tassels? Well, these Asiatic people have a great fondness for such ornaments. My two Japanese flutes have heavy crimson silk tassels quite eighteen inches long. Curiously, too, we find in very early Assyrian representation of hand harps on monumental slabs in the British Museum, exactly the same set of tassels—

Assyrian Harp with Plectrum.

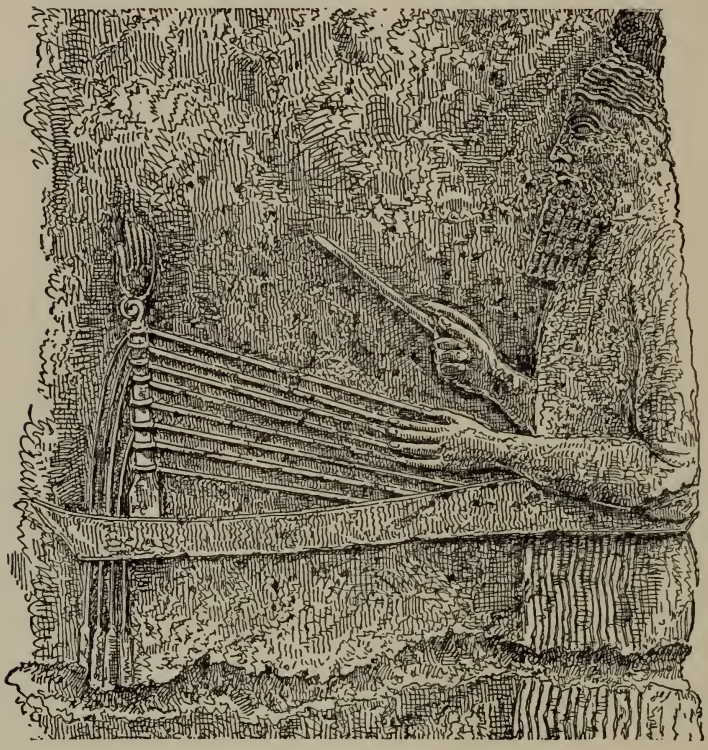


Fig. 42.

seven or eight in a series—depending from the bar upon which the strings are tied: knotted in fact to the tassels. And thereupon we wonder what community of intercourse was there between the ancient Assyrians and the Chinese that this same custom should be

adhered to by both people, in times so very far back: for Fu Hsi, the inventor, ruled 4746 years ago, and the instrument, bespeaks a very high civilization as then existing, and a refined state of learning and philosophy. It is worth reflecting upon; a simple fancy such as that perpetuated for well nigh fifty centuries.

The Assyrians have passed away utterly, and the Chinese crowd the earth, to this day reproducing the old traditional forms, the veritable instruments decorated after inherited customs, the music limited to the simplicity of primitive aims. No great nation was ever so barren of monuments as the Chinese. But what monuments need they? They themselves are the permanent archaic, and livingly represent their ancestors.

CHAPTER XXII.

In Ancient China.

THE TRUMPETS OF THE CHINESE.

Trumpets are amongst the very earliest of musical instruments, yet remote as is their date they throw no light on musical scales of the period of their use. Nevertheless for their very ancientness we cannot well pass them by without reference. Pictures of them appear in Egypt and in Assyria, but beyond that Old Time is chary of yielding evidence. The workers in metal in very early times undertook the fashioning of imitations of the horns of sheep, antelopes and oxen, and thus made they were used in primitive musical effects in relation to sovereignty or ceremonial. How strongly the aims of all royal and priestly offices determined the development even of the minutiæ of civilisation and the tendencies of domestic and industrial life, we are hardly able to appreciate with our modern notion of the individual assertiveness, limited only by the general good of the community.

So it is well that, in considering the position of the worker, we should remember that he worked in order to fulfil the demand or behest of the king or the priest; for both were to him equally sacred, and often indeed in one man the two offices were combined.

Music may have remained with the people, as an instinct which in simple ways found its gratification; but as an art to be cultivated it had its beginnings to order. The musical instrument had a definite purpose to fulfil; and, under royal or priestly guidance, so long as that purpose was accomplished, little further thought was given to it. Under such conditions there was the perpetual tendency to stagnation; progress was not only unacceptable, but to the old conservatism, as in later days, the new thing was unnecessary; since, if it were desirable, it would have been thought of before by the proper responsible persons. Only under such like estimate can we understand the lack of resource, the poverty of invention, through many centuries during the sway of ancient monarchies, as regards musical instruments.

The possibilities of the various types of instruments, as we know them, were unimaginable in those days; for the human ear had not so far progressed in sensitiveness as to be able to comprehend the feeling for tone, for colour, for range, or for expressiveness, as we by long use have grown accustomed to and look upon almost as our heritage. Yet how short a period has it been since anything like a collection of instruments represented by our modern orchestra attained even a passable mechanical development! And what are the two last centuries we look back upon in comparison with the thousands of years during which the primitive

instruments remained in their crude, barbaric immaturity ; unimproved, and with neither want nor longing that they should be improved !

As instancing this blank, imperceptive state of mind and feeling, the trumpet is very noticeable. An ancient instrument for ages : perhaps nothing more than a ram's horn, or horn of animal killed in the chase. Musically, to be ranked as a tooter or hooter. Then it became in ruling hands a means of signal : by sense of rhythm it conveyed to the hosts in field or fortress the message that was equal to words; and in royal and religious processions and ceremonies it communicated the intelligence for which the countless thousands waited ; to inspire them, to uplift them in a contagious sympathy of exultation, or to bow them to the ground in common feeling of awe or adoration. When wealth accumulated, the pomp of ceremony increased. Then came the worker in metal, copying the product of nature, yet not venturing much beyond it.

The old monarchies of Assyria, Babylonia, and Egypt, with their tablets and monuments and paintings, afford no evidence of a stage of musical advance from the early horn ; and we have but to contrast the wide range of our trumpet with the few notes producible on a cow's horn, to recognise how, in the absence of higher aim inciting to achievement which we call art, the dormant possibilities of a marvellous instrument should have been unevoked : empires passed away, and the trumpet remained a horn. Do not be mystified by a misconception to which words may lead. The horn as we know it was an unknown thing in those far away times ; its quality of tone not approached even, nor its chief constructive feature identified. The ram's horn is the

original parent of both trumpets and horns, and in the consideration of type belongs to that of trumpets more specifically. The shape of the *mouthpiece* of the trumpet determines the character of the instrument, and the old horns present only the same shallow cup. It is a matter to be noted how comparatively recent is the long, conical form of mouthpiece absolutely essential as it is to the quality of tone as we have it in the French horn used in our orchestras.

As seen in the Assyrian and Egyptian forms, the bell is evidently an added piece of funnel shaped metal, the first departure from the animal form; afterwards in the progress of music the shape was expanded with perception of its importance, until at last the bell became a marked configuration of symmetry associated with quality of tone, refined, penetrating, and sonorous. We have the old form still preserved to us in our fog horns, and some ancient horns of the town in our market place. In old Greek and Roman times some of the trumpets depicted possess very beautiful outlines; but there is nothing to indicate any great advance in musical evolution, and it scarcely seems probable that even then the production of harmonic notes went much beyond those common to the old trumpet horns. For an extended scale, much greater length than any we see given would be necessary: else the harmonic series could not be built up. Our old coach horn would about represent the limit of the musical value attained; gradually, however, longer tubes came to be used, and variety in shape and purpose awakened the perceptive faculty to the possibilities of higher things.

Yet how strangely dull is human inventiveness, unless the ideal aspiration precedes the routine of the worker,

unless handicraft is stimulated by demand going before, of "saying give me the power to accomplish more; feed my ambition." So we traverse the course of long ages, finding it barren of improvements.

The Hwangteih

Fig. 43.

The Haot'ung.

Fig. 44.

The Chinese furnish a remarkable instance of a nation inventive yet stagnant; for although this people had the prototypes of almost everything that with Europeans

has become of infinite value to modern civilization, the Chinese made nothing of them in practical development. Midway in time—how, when, and where, there is no information to guide us—the Chinese suddenly evolve a new thing, a telescope trumpet, a slide trumpet, the latent principle of the trombone; yet nothing came of it in their hands: it does not seem even to have been devised for any musical aim, nor to have a purpose beyond convenience.

The two trumpets here illustrated, called *Hwangteih* by some authorities, but by Van Aalst (that of the pattern we should in a modern house take to be a hearth broom) is named *Haot'ung;* but really Chinese names have such a never changing likeness that they are as difficult to distinguish as Chinese faces; and as for remembering them, my advice is, Do not try. These trumpets are on the sliding tube system. The *Hwangteih* is in three parts, and the *Haot'ung* in two parts, the first named being of very slender dimensions; the latter is often made of wood covered with copper, but when for military use it is of copper only. And here we should notice the feature peculiar to all trumpets in these Eastern lands, the extremely shallow disc like mouthpiece, with only the faintest indication of a cup,—throughout India, Burmah, Siam, and in fact the whole Asian regions contiguous. The effect of a shallow cup is the easier production of high, shrill notes; and it may be that the lip muscles are in these races thin and tense, the expanse of the disc merely exercising pressure, leaving only a minute portion of the lips for vibration equal to the diameter of the very narrow aperture entered by the stream of wind. The actual force and vigour of the breath would thus have

a more predominant influence than any calculated variation of the lip muscles by will. The whole character of the music which satisfies these semi-civilized people seems to corroborate such a view. Shrillness and ear piercing intensity were the effects aimed at.

These trumpets are made in several sizes ; but as the proportions differ from those which we find necessary for full harmonic development, it does not appear that more than three or four notes are obtained by ordinary playing. The globular ornaments upon the tubes serve the same purpose as they do in European instruments, they enable the player to press the tube to his lips with strength ; and evidently the notion is a very old one,—showing us how little is really modern. It is curious too that years ago in the British Museum I found a little bronze statue of a trumpeter of the Roman period, the trumpet being shaped at the end like the *Hao-t'ung*. At the time I wondered at the singularity, trying to find out some meaning and purpose in such configuration, but was baffled ; and it is only in the presence of the Chinese instrument that one sees in it a survival of an Asian original type brought by Greek or Roman into Europe after far Eastern incursions.

The *Hwang-teih* and the *Hao-t'ung* are reserved for marriage and funeral ceremonies, in which they have a formal part assigned to them ; but it is chiefly for the marking of time or progress in the ceremony. Some authors say that the *Hao-t'ung* is only used in funeral functions, and that it gives a grave befitting note, prolonged and wailing.

The *La-pa* is another trumpet with telescope slide,

and is, one would suppose, the most modern of the three. It is the military trumpet, and it gives four notes, differently estimated by different writers. It is singularly like the ancient Roman Lituus, and I conceive it probable that the players were in advance of the procession, and that the return curve of the bell

The La-pa.

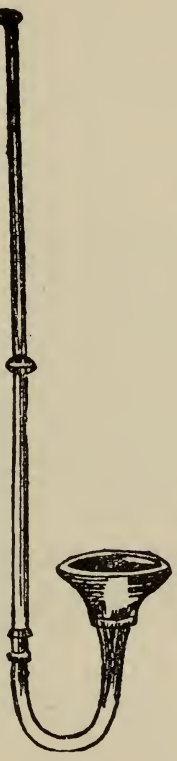


Fig. 45.

was made with the intent that the sounds or signals should be thrown backward for the better hearing by the hosts following. The itinerant knife-grinders are stated, by ancient privilege, to be accustomed to use the trumpet to proclaim their calling in the streets.

Of the drums used by the Chinese, little need be said; drums are much alike all the world over. The Chinese have them of great size, and as large as five feet in in diameter. They are highly ornamented. Various sizes are ordained to be used in the Confucian temple, each with some specially allotted service; thus one placed on the Moon Terrace is struck six times at the end of each verse, giving two beats in answer to three beats of the larger drum. So orderly is everything arranged and traditionally kept up.

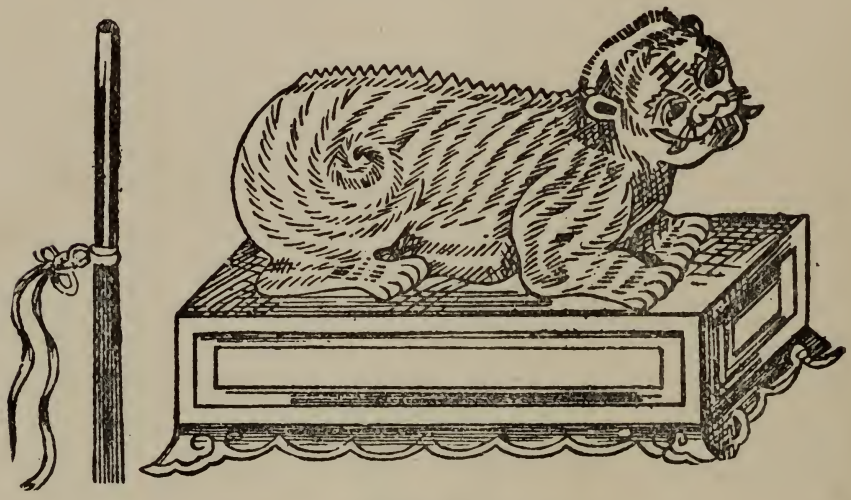


Fig. 46.
The Yü or Tiger.

There is one instrument—the *Yü*—so singular and original in character, that it is worth serious consideration whether it would not be well to introduce it into our orchestra, to further the Wagnerian development of the music of the future. We have great use in

our day for triangles and cymbals, but they cannot reach the effect produced by the *Tiger*, a Chinese picture of which is here given. The animal is somewhat idealised, it must be admitted; almost as much so as permitted in a photograph. Mark the singularly fascinating expression of the face embodying pain, possibly torture; and then the reposeful attitude of the tail; the whole figure symbolising the two conditions under which music exists. In the musical scheme of the Chinese the normal state of the animal is quiescent, but its voice is indispensable to the winding up of the finale. You see that the *Tiger* rests upon a resonant box, about three feet long and twenty inches or so wide; and it has on its back twenty-seven teeth, neither more nor less—an elaborate mystical engarnishment much resembling a saw.

At the end of the grand Confucian Hymn performed in the presence of the Emperor and all his Court, attended by his feather-swinging dancers, the chief officer assigned to this service strikes the *Tiger* on the head three times; three fateful knocks (thus let it be noticed anticipating Beethoven's ominous device). Then with a vigorous swish he passes his stick three times along the projections on the *Tiger's* back to announce the end of the strophe; three wierd screeches are heard succeeding each other (to the great delight of Straussians) rapid as flashes of lightning, and in a hideous whswreech the scene ends.

And,—the Emperor retires.

CHAPTER XXIII.

The Music Heard in Far Cathay.

THE OLDEST WRITTEN MUSIC.

Wherever man is molested by dreams of the night, there, in every land, will be found some form of pacification of the spirits of the dead, that they may not cause harm to survivors in the land of the living. The earliest form is generally by conjuration, by magical aid, and then the mind grown bolder as the years advance, resorts to threats, and the invocation of curses upon the unfortunate dead should he not hear and heed; the stage that follows is the intercessory stage when some one is brought in to render service, one who knows all the powerful magic of ceremony to compel the spirits, and who making it a special work, is paid for undertaking the responsibility of pacifying the spirits at due times and seasons. The person thus called in to render service, whether known to the people of the tribe as witch, magician, medicine man, or priest or priest-king, became, in this order necessary and inevitable in

the growth of a civilized life. As the centuries progressed the secret ceremonies were exalted into pageants, and later took the form recognised as "Ancestor Worship," the shifting grades of which over the known world are innumerable. From various causes familiar to the student of history, Ancestor Worship, which had its origin as a private arrangement, was at length transformed into a public function of the highest importance, with elaborate ceremonials and ritual observances, wherein such music as was possessed by the people naturally held a predominant influence.

The Chinese worship "the Spirit of Heaven" and "the Spirit of Earth," and in their earlier times having no priest, they delegated the heavenly part of the observances to their Emperor, and busied themselves only with the earthly cares, and made the "worship" of their own particular ancestors the chief of their investments; so onerously does this observance press upon them that their outlay often beggars them, the observance has a superstitious hold upon the race, seems to be strong as heredity, ineradicable. We may smile at the Chinese, but have we not rife in our own population, superstitition equally strong regarding fortune-telling and charms and palmistry, and the deeply ingrained belief in the virtue of fine funerals.

The chief duty imposed upon the Emperor is that of rigidly observing the traditionally prescribed ceremonies of "The Worship of Ancestors" at which the greatest display of Chinese music, with full orchestra is made, everything connected therewith being minutely regulated; the number of musicians, of dancers, of instruments, of vases, and all kinds of music and genuflexions, and even words rigorously fixed. Dancing was also

associated with the music as equally sacred ; in ancient times it held a conspicuous place in worship, having been first introduced into the ceremonies by the Emperor Shun, 2255 B.C.

We read that in "the Chinese Classics" a great Duke of one of the Royal Dynasties, TAN FOO, who lived 1325 B.C., is written of, and in the ode it is related among other things that "he charged his Minister of Instruction with the building of the houses and the Ancestral Temples." By this confirming the antiquity of Ancestor Worship at a date, far off as old Egyptian dates, when customs, so similar, existed.

The great age of the Chinese Classics is undoubted, and Mr. Simcox says even "the most recent document in the Shoo-King belongs to the seventh century B.C., and of the famous "Bamboo Books" that "the annals of the Bamboo Books may rank with the Babylonian Chronicles in authority." These books were found after they had been buried 600 years in the grave of King Seang of Wei, who died 295 B.C. His choicest treasures, entombed with him according to ancient custom, of which we were reminded by the recent find of the royal chariot of bronze and gilded ornaments in the Tomb of Thotmes IV.

Ancient Chinese texts were *printed* as early as 593 B.C. In a report by Imperial order at the beginning of our era, the royal library held 165 collections of books on Music, from sixteen different editors.

My habit is to secure dates, knowing them to be of utmost value in an enquiry such as this. For a due estimate of the relation of Chinese music to that of other early nations it is well that you should compare these with the dates occurring in the previous chapters.

Not a shred of knowledge exists of recorded music of Egypt or Babylonia, the earliest Greek example, the Delphic marble, dates from the third century B.C. In all countries no doubt certain folk-tunes exist by tradition of centuries, may be of ages, which ultimately are set down and put into modern notation.

In China the music of the past was looked after by "The Sect of the learned" and the responsibility for authenticity rested with the Emperor, who by dynastic right was chief of the Sect.

The Chinese attribute to an unknown antiquity the music performed at their great Confucian celebrations, and it may well be that this music is the oldest written music in the world.

Some musically-minded folk have besought me for specimens of Chinese music, wanting to see how it looks. This demand I cannot supply, for Chinese type would be necessary and Chinese compositors; moreover it would not enlighten, would to us look as columns of hieroglyphs.

This is a bit of Chinese ritual music. It is called the Guiding March, and is played by two *Sheng*, four other instruments also in pairs, two drums, and two pair of castanets. The music is played when the emperor, with the princes, dignitaries, and attendants, passes the second gate to enter the temple. The circles and dots at the side of several of the notes are signs that the drums and castanets are to sound. As you would not understand the march by the Chinese symbols, I have done it into English, and you have to read from the top of the right hand column, and then down each column beyond in succession—the gaps only indicate the holding on longer of the note preceding:—

g_{o}·	D_{o}	c_{o}·	A	C.	a	d	
		a		a_{o}	c_{o}	d.	
		c_{o}·	g_{o}		d	a	M
	C_{o}	d	f.	d	c_{o}	c_{o}	A
	a_{o}·	c_{o}	D	c_{o}	a	d	R
	C	a.	C_{o}·	a			C
	D_{o}·		a_{o}	c_{o}·	g_{o}		H
	C	g_{o}		d	f	d.	
	a_{o} ·	f.	d.	c_{o}·	D	c_{o}	

The small letters are notes within the treble and the capitals for notes below it. Looks like a very early anticipation of tonic sol-fa. If you write this down on the treble stave you soon become proficient in Chinese scoring,—that is, provided you translate the Chinese characters correctly, and comprehend also the multitude of little signs used in addition, which to the native are easy of recognition.

I take up a little book that I have of Japanese songs and open it, beginning at the end, which with them is the commencement, and it looks, as I scan the page, very much the same in fashion as the English columns which I have set up before you. The characters are printed in black, and the signs in vermilion, on a beautiful silkworm paper that glistens with silvery sheen like a cocoon, and has impressed lines separating each column of characters; and each page is as a double page without inner margins, six columns to a page. Strange to say, the little book, although it measures only six inches by two inches and five eighths, is quite

six feet long, for it folds backwards and forwards after the fashion of the child's Jacob's ladder. And this is the little book that a little Japanese maiden will take out of her sleeve and therewith caress her thoughts with music, opening it to and fro as her fancy leads her, and perhaps finding there her song of songs, where hiddenly folding there, too, may be felt some flower token that she cherishes for remembrance, even as we treasure crushed pansies and violets. Be sure, the nature that we call human nature is much the same all the world over; in one land it is but a variant of that which it is in another. The love songs as usual come first in interest, and occupy a large share in the national music, both of Japan and China; but sentiment expends itself in many ways. One song is entitled the "Haunts of Pleasure," it is an early composition and a still popular work, the theme of which is ever new in London as in Kyoto and Peking. Then in due course sentiment displays itself in nuptial songs and in songs of domestic life,—life, its comedies, tragedies, and what not; and then in funeral odes and lamentations. I notice how old the custom is of giving one or two lines of song for the voice, followed by an interlude for orchestra.

The ritual music of the Chinese is held to rest upon tradition mainly for its due performance, as there are no distinguishing signs for time and movement, and little or no attempt at expression; indeed, all meaning is left to be shown by the attitude of the singers, and what we should call theatrical movement.

All their music is, in fact, subordinated to the vocal performer, singer, or reciter; for dancing is with them as much a religious function as it was to the tribes of Israel in the days of Miriam or David. The singing

as always in unison, or attempted unison, relieved occasionally by a few fourths. For of harmony they have no idea ; no feeling for it. These people have no conception of the purpose of an orchestra, as we understand it. The Chinese orchestra is merely a combination of instruments which for ceremonial use alternate with the vocal music, each instrument having its allotted place for sounding at the end of some strophe or line of the hymn, and comes in much as our snatches of instrumental melody or harmony in recitative. There is generally some mystic reference understood by the hearers, as well as the indication of the particular point reached in the ritual ceremony ; such as is conveyed, for instance, in the Catholic service when bells are sounded a precise number of times, or when at certain places only is the organ allowed to be heard. So with the Chinese, only at a certain stage of the progress of the ceremony are the stringed instruments ordered to play, and at another only the wind instruments, and at others the instruments of percussion of which they have so many varieties,—drums and chimes, gongs and cymbals, castanets and tambours, and tigers. The music exists for the ceremony ; not for itself.

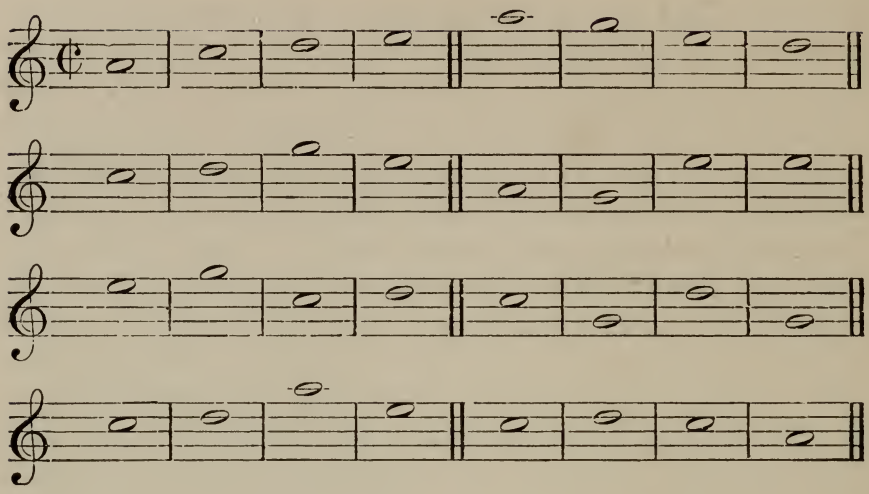
The popular love of music is displayed everywhere in daily life, bands of musicians parade the streets, all the domestic festivals are celebrated with music, and children in their play are constantly singing. Girls are taught to play the moon-shaped guitar, and the balloon-shaped, and the three-stringed guitar, whilst they sing the ballads which the Chinese say are thousands of years old.

The singing is very peculiar, being a kind of singsong extremely nasal ; so little have the lips to do with the enunciation that it can hardly be called vocalisation.

This we find almost everywhere the characteristic of barbaric song; the savage and the semi-civilised seldom get beyond a high pitched nasal chant. Yet, when civilisation has progressed, the strong conservative instinct remains, and this same twang is a delicious indulgence, and a sign of long descent and high breeding. I am told by those who have had the experience, that the only opportunities of hearing the natural voice of the Chinese and Japanese in singing are when groups of workmen are starting off to work, or when soldiers are passing; and then some good musical effect is produced in unison, the singers joining in their quaintly sounding and well known melodies, which have been handed down for generations. No decent, self-respecting, or respectability-loving Chinese would condescend to the vulgarity of singing in the natural voice: they use invariably falsetto, emitted mostly through the nose, the mouth almost shut. Male and female alike cultivate this evidence of gentility.

The music of the hymn in honour of "The Most Holy Ancient Sage Confucius" is very interesting when we consider the time during which it has been preserved and handed down, and the national importance attached to it. It is performed twice a year with great pomp on the "lucky days" chosen for the worship of Confucius and the spirits of departed sages in the spring and autumn of each year. Superstition assigns to the music a particular keynote, in which the hymn is to be sung, according to the month of the moon; so that in the second month the *lu* is *chia-chung*, and in the eighth month the keynote is *nan-lu*.

This is the first strophe of the hymn to Confucius which they play.



That is to say, it is as near as our notation can give it. See also page 151 ante for concluding strophe.

It is called the "Sacrificial Hymn to Confucius," the altar being loaded with offerings of meats, grain, fruits, wine, silk, spices and incense. A characteristic of Chinese worship is the firm inculcated belief that the spirits in whose honour a ceremony is performed descend from heaven to receive the offerings prepared for them.

The hymn has six stanzas, divided to accompany the ceremonial stages, thus,—

1. Receiving the approaching Spirit.
2. First presentation of offerings.
3. Second presentation.
4. Third and last presentation.
5. Removal of the viands.
6. Escorting the Spirit back.

As in Old Chaldea, the people of that vast valley of Mesopotamia, and from far up in Assyria, crowded their

dead to Erech, their primitive home, and the burial place of all their race; century after century all who could do so sent their dead down the great river ways to repose near the mouth of the Euphrates, to Erech the sacred city of the dead. The dying trusted their kinsfolk to do this last duty. Even to-day the Chinaman will take his coffin and perhaps a small handful of earth with him, when he leaves his country for Australia or California, and looks to some of his kin to send him home when he dies in a foreign land, and they perform the trust, labelling their countryman's coffin "dry goods" to get him home at the cheapest rate.

This worship of ancestors is not only the chief feature of the Chinese religion; it pervades the daily life of millions, and is believed in with a strength of sentiment and in a way which we find it difficult to comprehend. Yet, as we know, ancestor worship is perpetuated with us to this day,—witness "Almanac de Gotha," and "Debrett's Peerage." Oddly enough comes slipping into my memory a reminiscence of a day long past, hearing of an old dame I knew saying to her grandson: "Ah, Willie, my boy, if your father had only married Miss B—— instead of your mother; your life would have been very different; you might have been riding in a carriage." And she, poor simple old soul, she wondered why the laugh went round. Yes, the "might have been" is a haunting idea from which few altogether escape in life. Would you know my thought? I was thinking that had I lived in antique times—and some would say, how know you that you did not so live? —then verily I should have been irresistibly impelled to the worship of one's ancestors, and should have comprehended how it entered into the heart and the

conscience, and with music and symbolism set up a real and binding obligation not to be gainsaid; instead of which I am drawn to worship the offspring of somebody else's ancestors, and find that to be the greater mystery. Ah, me! what a queer topsyturveydom civilization brings about. Did you ever ever try to get behind a child's mind, to see into the inner recesses of its realistic consciousness? Watch the little girl with her favourite inanimate doll, how she holds important serious conversations with her; how the doll has to be good, attentive to her lessons, dressed and undressed, with a most serious belief in its participations in eating and drinking and playing day after day. What if no words come in response; if the food prepared is not eaten? The belief suffers nothing; the little lady will supply the fitting speeches in reply, and will eat up the offerings of sweets herself. Yes, the bewitching creature will go on believing. She lives in a world of lunacy all her own, with which our bigger world has nothing to do; and unless we can become as little children, it passes our understanding. This is the stage of mind at which the Chinese stay—checked, undeveloped. The development of the mind of the child life that is growing around out feet we watch with never-failing interest, well knowing that childish things will be put away, and its illusionary world will fade and be as a world of dream. Yet the future of the Chinese we cannot so interpret by any signs of the present outlook, nor imagine how many centuries must pass before their minds can be fitted to work in parallel grades with European thought and culture.

CHAPTER XXIV.

Evolution of the Lyre, Harp, and Lute.

THE BOW WITH THE BOAT.

Art is always the superfluous. Food and shelter are the first necessaries, they drive man into direct courses of activity; he becomes a fruit gatherer, a hunter in forests, a hut builder, or cave dweller; his intelligence prompts him to the making of bows and to using of arrows, and this is an advance in mechanical perception; beyond the mere force of darts or spears in this new aid to his strength. After his chief wants are satisfied he has leisure, and his instinct, after rest, is towards activity of some kind, and what he does then is pass-time. To please himself, that is the object of his exertion, willingly he undergoes much to this end.

The man who first fixed a second string to his bow began the art of making stringed instruments of music. In the chase this second string is of no use to him. He put it there solely for his pleasure. Many a morn preparing his bow for the chase, many an eve, ere

setting it aside unstrung, he has "heard the tense string murmur," has listened and the sound has pleased him; it is the voice of the string; a chance wish comes into his quiet mood, and from desire to gain another sound, he adds another string to please him more.

The beginning of a lyre is in the bow; but something beyond is needed for the endurance of the sounds, and the aid required is found in the boat allied with the bow. When the hunter came down from the mountains and the dark forests, into the vast fertile valleys of the great rivers, he naturally turned his industry to cultivation of the land, and here, amongst the watercourses set himself to the task of constructing boats, that he might go hither and thither. Perhaps the bark of old fallen trees prompted his first ventures, or as native races do at this day, he made a boat of papyrus stems, plaiting them together; the flowering ends of the stalks closely gathered up, naturally curved forming the prow, and in this way, leaving the after portions to be spread out, filled in between a floor of reeds in such a fashion as would produce a floating raft, or a carrying vessel capable of bearing him and the produce he would convey upon the waters. Singularly enough this simple craft presents an appearance that may have furnished the idea of a prow. The prow is so persistent a feature in the build of ancient vessels, that possibly its ornamental retainment may be due to the early rudimentary possession.

Sir Harry Johnston saw this kind of papyrus boat in Uganda, floating on a little lake in the forest, making so pretty a picture that he photographed it.

Trees were hollowed by burning out the interior, long before tools had been devised, and the next suggested stage would be when young trees riven, yielded planks

that could be bent into form for boat-building. Soon after he had attained this mastery we should find that the original cave-dweller became in course of time a boat dweller. Thus we imagine it happened that the earliest lyre took the form of a boat, or rather of a half-boat, the dwelling half, roofed or covered in, wherein the family lived mainly, as has been the immemorial custom in the great river regions—a custom existing even to this day. The skill acquired in developing the lines in boat-building was precisely the skill that was applied to equal advantage in lyre-building, and thus the sounds were housed.

To understand aright the process of evolution I think it very desirable that the imagination should have free play, and take us into the scenery and into the time in which it was going on, and if we can, by any chance glow of fancy, get the very atmosphere about us.

The earliest lyre of which we have any representation is the three-stringed lyre. Such a lyre is seen at page 13, the same as was slung on the mast of Queen Hatasu's ship that she sent to the coast of Arabia.

Next in advance is the four-stringed lyre of the same pattern. In the British Museum there are two ancient examples of these. (*Fig.* 47). They usefully make clear the construction. The upper figure shews the complete instrument; the lower figure shews the interior part of the construction, the skin or parchment covering of the top of the boat being absent. The framework was covered over with thin wood or with skin, lizard skin for choice. Some illustrations of examples of this kind of lyre show that the end of the bow where the pegs are inserted, was cut to receive the strings, exactly as in later ages in violins.

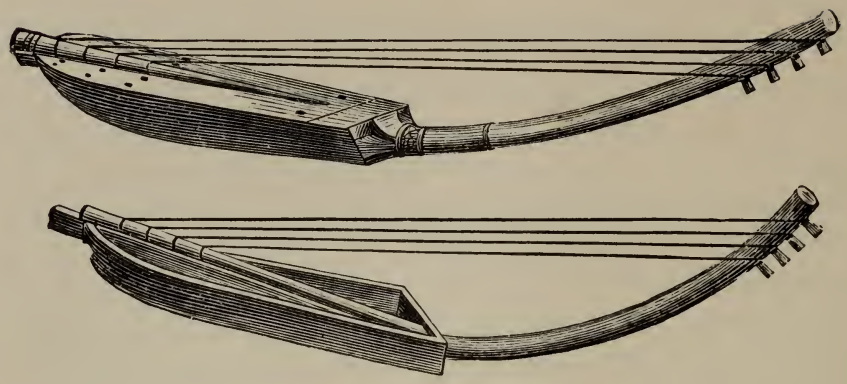


Fig. 47.

This summer at Burlington House, Mr. Garstang exhibited a five-stringed lyre of this pattern which in his exploration he had recovered from one of the tombs at Beni-Hassan, which had not been in daylight for more than three thousand years. The strings naturally had perished long ago.

In the earliest times after the Egyptians had begun to depict the incidents of their daily life, and to make record of their nation's history on the walls of tombs and temples, we find three distinct types of musical stringed instruments possessed by them ; sometimes the representations of these are given in relief carved in stone, sometimes incised only and painted. Not decoration but history their minds were set upon ; each man who had power held his own individual history to be of supreme importance, and thus there has been left to us a picture book of priceless veracity.

In the times when these pictures were made they already had the instruments in a high state of development, say

from 4000 to 6000 years ago, and we are left to guess how long a course of time must have been necessary before from the primitive rude state they could have reached the perfected state the paintings disclose to us.

To make clear the way of evolution I recognise but three types, and class these as,—

1. The boated lyre; half-boat form.
2. The cross-bar lyre; a two-horned form.
3. The lute; paddle form.

The boated lyre preserves always the hollow shape and form of half a boat covered in, and is built up in planks or ribs, and the strings are bow-strung and strained from point to point.

Upright Lyre (half boat).

Fig. 48.

The shape is seen in many of the representations of the larger boats used at the time. Two of these harps laid lengthwise together, joined at the thickest part, will give the shape I refer to, showing by comparison how naturally evolved.

Harps are indeed lyres of larger growth, and in the reign of Rameses the Third had attained their full

Harp from the Tomb of Rameses III.

Fig. 49.

development, as seen in the grand painting in the tomb at Thebes discovered by the famous traveller Bruce; posterity, has given it the name of Bruce's harp. In Sir Gardner Wilkinson's wonderful storehouse of knowledge on Egyptian things, large full-page delineations are given of this and its companion harp. Musicians frequently remark upon the absence of a

front pole, their impression being that consequently the tension of the strings must have been so weak that the tone would be dull and ineffective ; this however is an impression only, a practical acquaintance with wood-working and bending elastic ribs to shape, would reveal a high state of resistance particularly effective for the purposes of resonance, and would fully justify the old Egyptian craftsmen in their choice.

Many of their harps had from ten to seventeen strings and some even twenty-one and twenty-two.

The harps were frequently the heighth of a man ; they were painted tastefully with lotus and other flowers, and richly ornamented and inlaid. The tuning was by means of pegs, sometimes two rows of pegs are shewn. There were long slit holes at the back for giving freedom to the air, exactly as found in modern harps.

No instance has been found of harp with supporting pole or pillar. The strings were always of gut. One harp has been discovered with strings which though they had been buried more than 3000 years still sounded on being touched. A curiously formed harp is shewn in the Paris collection having twenty-one strings, or places for strings, enough left to exhibit a manner of tying the strings (see enlarged design of this mode given on next page).

That the style had a vogue is evident since another example exists in the Leyden collection, though less complete in condition ; the framework still retains the fine green colour as originally painted. Sometimes the woodwork was covered with leather, green or red. This instrument is built five sided in section, and at the back has three sound holes. The resonance should be very strong. The string-bar is well supported by its

double bearings and for the kind of music demanded, I should not consider that the tuning would be of the difficulty some writers suppose.

As the boated lyre betokens a river influence, so the lyres of Class II. indicate a pastoral origin, and this is well portrayed in the Egyptian painting discovered

The Paris Lyre.

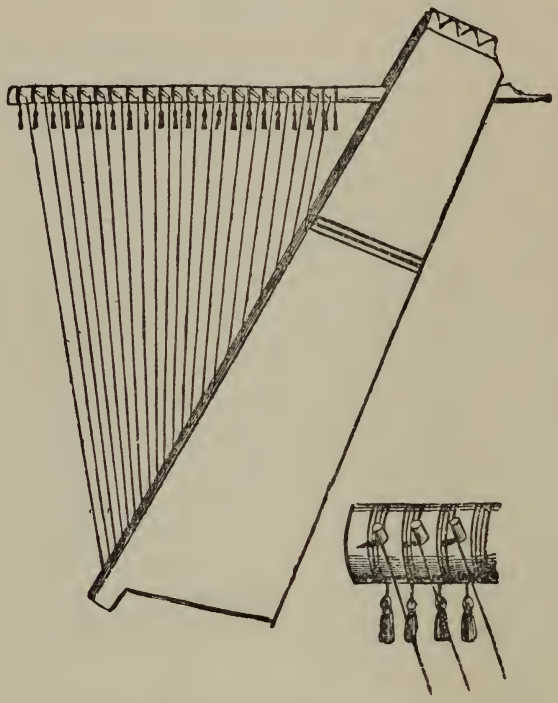


Fig. 50

by Sir Gardner Wilkinson in a tomb at Beni-Hassan. It is a painting representing the arrival of strangers in Egypt, and one portion of it introduces a lyre having six strings, the man holding it in the primitive fashion, and playing it with the plectrum, he is preceded by an ass bearing a burden.

The true origin is undoubtedly Asiatic, it came, perhaps, by way of Arabia into the central Nile region, and the parent form is best shown in the illustration next following (*Fig.* 52). In this shape it has existed from time immemorial, and down to the present it is found in use by native tribes, in Nubia, Ugandi, Abysinnia, and other regions. Sir Harry Johnston, in his splendid work on Uganda, gives a picture of a native, a Kavibondo, playing this same kind of lyre, eight-stringed.

Fig. 51.

He also gives an illustration of a native Mbuba playing on a strung bow, and holding the string between his teeth thrumbing it the while (he by frequently altering the shape of the mouth-cavity varied the sounds to agree with the changing resonance), in fact, making a jew's harp of it, which is a singular confirmation of the view I take, tracing the origin of stringed instruments to the bow.

The picture of a *Kissar* here given is taken from a fine specimen presented to the South Kensington Museum by the late Viceroy of Egypt, it has strings of camel gut, and a plectrum made of horn, which is

The Kissar.

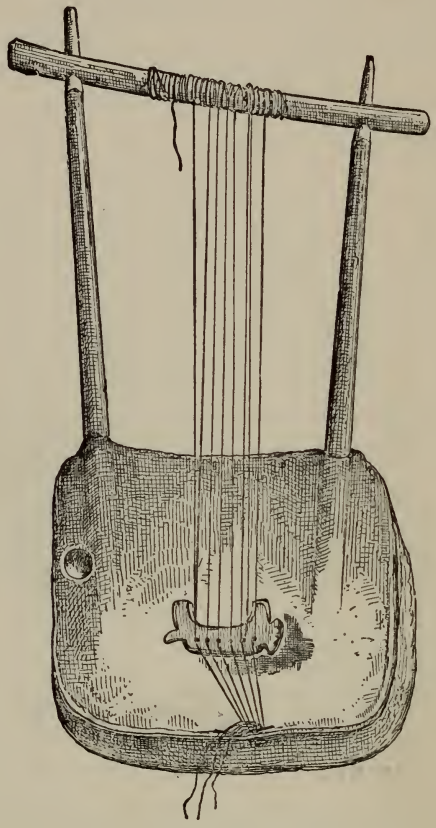


Fig. 52

used alone or associated with the fingers. All harps it should be remembered are, as occasion may require, subject to the use of one hand for damping the strings, which else would continue sounding too long for the right effect in the performance of the music.

From a rude instrument of this kind the true Greek lyre was in course of time evolved. I trace the intermediate stages still by the banks of the Nile. They call it in Nubia the *Kisirka*, and by other kindred names in the heart of Africa. That the bar slants is particularly a feature to be noticed, and that the tops of the uprights or horns pass through this bar. The construction of the sounding body is arranged in a square form as of a stretching framework of reeds or rods, and is covered by a skin usually. In fact the frame suggests to me the coracle or fishing punt, seen in the sculptured slabs from Assyria and Babylonia. The idea of the instrument may be originally based upon a shallow coracle, the supporting seat in the interior affording fixture for the uprights, in the same way as we have seen in boats. (*Fig.* 47).

One of these slabs contains representations of three players upon harps having the same slant bar for the strings, the particular utility of which is in its enabling players to tune the strings by pushing them higher up, or pressing them a little lower in position, thus changing the tension as they desired for the pitch of any string, a method which we find was retained in Egypt during long periods.

The slab from which this illustration is taken is one recovered from the palace of Ashur-nasir-pal at Nimroud. The slabs possessed by the British Museum date some of them as far back as 875 B.C., so that they are not nearly so old as the Egyptian pictures, although the character is apparently more archaic. Nevertheless the Babylonian Antiquities range back to dates almost as ancient, that is to 4500 B.C. So that there is justification for the belief that these harps were in use in

that region in a very remote period, the relics whereof have perished; soil, and climate, and custom, have

Fig 53.

been favourable to the preservation of relics telling of the musical instruments of past life in Egypt

from earliest times, advantages which Babylonia had not.

At the hands of the Egyptian the instrument soon took a refined ornamental form (*Fig.* 54), whilst still retaining its particular slant bar, and the horizontal method of holding, and the plectrum to sound it by. This is

Fig. 54.

Fig. 55.

generally considered to be "*the magadis,*" but I do not see it so. I see only a square sounding box, with ornamental lines, but no pressure bar additional. More will be found upon "*magadizing*" further on.

The next transition undergone proves to be one of great importance and significance in history, the old

method is discarded, and an upright position adopted (*Fig.* 55), the fingers of both hands being brought into use as in the larger lyres of the boat type. Thus the two styles are brought into accordance also, the performers benefitting by the change. Likewise we should notice that the number of the strings has increased to eleven or twelve, and there is a constant tendency in this direction, so that lyres become hand harps, light and portable, yet having many strings.

The Berlin Lyre.

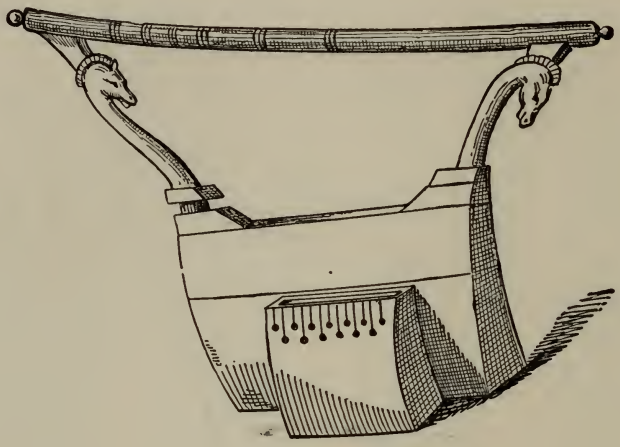


Fig. 56.

In the Marbles from the North West Frieze of the Parthenon at the British Museum, harps of this kind are represented, and are seen carried in the same way as in *Fig.* 55; though the remains are fragmentary the lyres are still clearly standing out in relief, and close beside them the flutes, and though but little of the carving of these remains, yet looked at from beneath, the under cut plainly shews that the flutes are double flutes as I mentioned earlier (*page* 75).

This pattern was further improved, artists exercised their skill in new designs, decorative, and constructive, the greater fulness of the sounding body of the instrument augmenting the sounds in like degree.

Fortunately two complete specimens are existing, one in the Berlin, the other in the Leyden collection, is perfectly preserved with exception of the strings. Here places for 13 strings are shewn. The body of the instrument is of thin wood and is ten inches high, the total height being two feet. The air holes are at the bottom of the lyre.

The Lute is a very distinct type and equally ancient, except that we may infer it to have arisen after the Boated and the Bar types, inasmuch as it bespeaks a higher order of skill and intelligence that comprehends and grasps a musical system ; the design of the instrument was conceived accidentally perhaps, but the idea of obtaining a series of sounds from proportional measurements upon one string was an advance in the mechanics of music making.

I distinguish Class III. as of the lute form or the paddle form, originating maybe, in association with the coracle, used by the man to move himself about in water-courses and lakes in his daily business of fishing. The coracle, exactly like those of ancient British build, is depicted on the Babylonian slabs.

The Egyptian name for this lute is the *Nefer*, so ancient is the *Nefer* that it is found in paintings in tombs of the VI. dynasty, B.C. 2000.

Many paintings show this little instrument, it is small and flat, is from three to four feet in length, and has from two to five strings, and always this form suggestive of its paddle origin ; the pole, called by us a long neck,

has at the top pegs which are turned to bring the strings into tune; the instrument is played with the plectrum. Sometimes it is shown played with the fingers only. Often we meet with the statement that the *Nefer* finger-board had frets, but I am myself not quite satisfied upon this point, because the lines that in black and white look like frets, yet

The Nefer supported by a silk band.

Fig. 57

when inspected in the large coloured fac-simile productions given by Rosellini and others, appear as nothing other than lines of the decorative patterns inlaid on the flat finger-board.

That such fancy designings should be a guide to the player seems very probable, but I do not think that the idea of a raised fret had then arisen; in later times

there is no question that frets were adopted when precise relations of pitch were sought for in the closer study of the art of playing. In their rudest form pieces of camel gut are tied on the neck to act as frets.

It is still a vexed question whether the Egyptians required, from even their many stringed harps, anything more than certain runs or conventional sequences of

Dancer with the Nefer.

Fig. 58.

tones, little simple tunes that were traditionally retained, and reiterated rhythms, or possessed the knowledge of harmony as a science, and used their instruments in pursuance of aims to produce effects of sound regulated by laws based upon science. They had a great variety of instruments we know, and that the fingers of both hands were used to pluck the strings of the harps,

and it seems hard to deny such a claim to a people so skilful and intelligent. Mr. W. Chappell strenuously insisted that the Egyptians understood and practiced harmony, and some other writers support the claim. The most learned authorities take the adverse view and say that nothing yet discovered by investigation warrants such a supposition. All that can be conceded is that the simple consonances of two sounds were known and practised. The present state of Asiatic nations tells very plainly that a large number of instruments may be used in combination without, through the course of ages, any idea of harmony being evolved. The Chinese, Japanese, and Siamese Orchestras are a standing witness of this fact in the history of human races.

A little cane harp, used by the natives of Borneo I believe, came into my possession many years past, and is probably nearly a century old. This simple instrument shows how easily satisfied the ear is with pleasing sounds when the people have continued in an early stage of civilization, and still represent the primitive state of nations that have passed away. The harp is 13½ inches by 9, and is constructed of pieces of cane, 29 in number, lashed together raft-fashion. The strings are formed of the outer silicious layer of the cane; a double incision is made on the surface of each rod to within an inch of each end, and the strip thus severed is lifted up to form a string: the opposite side of the rod is treated in the same way: the strips vary in width from a sixteenth of an inch, less or more. The 29 rods are laid together and firmly braided with a wire-like fibre, making a flat, raft-like form, shewing the strips or strings back and front; then rods are slipped under

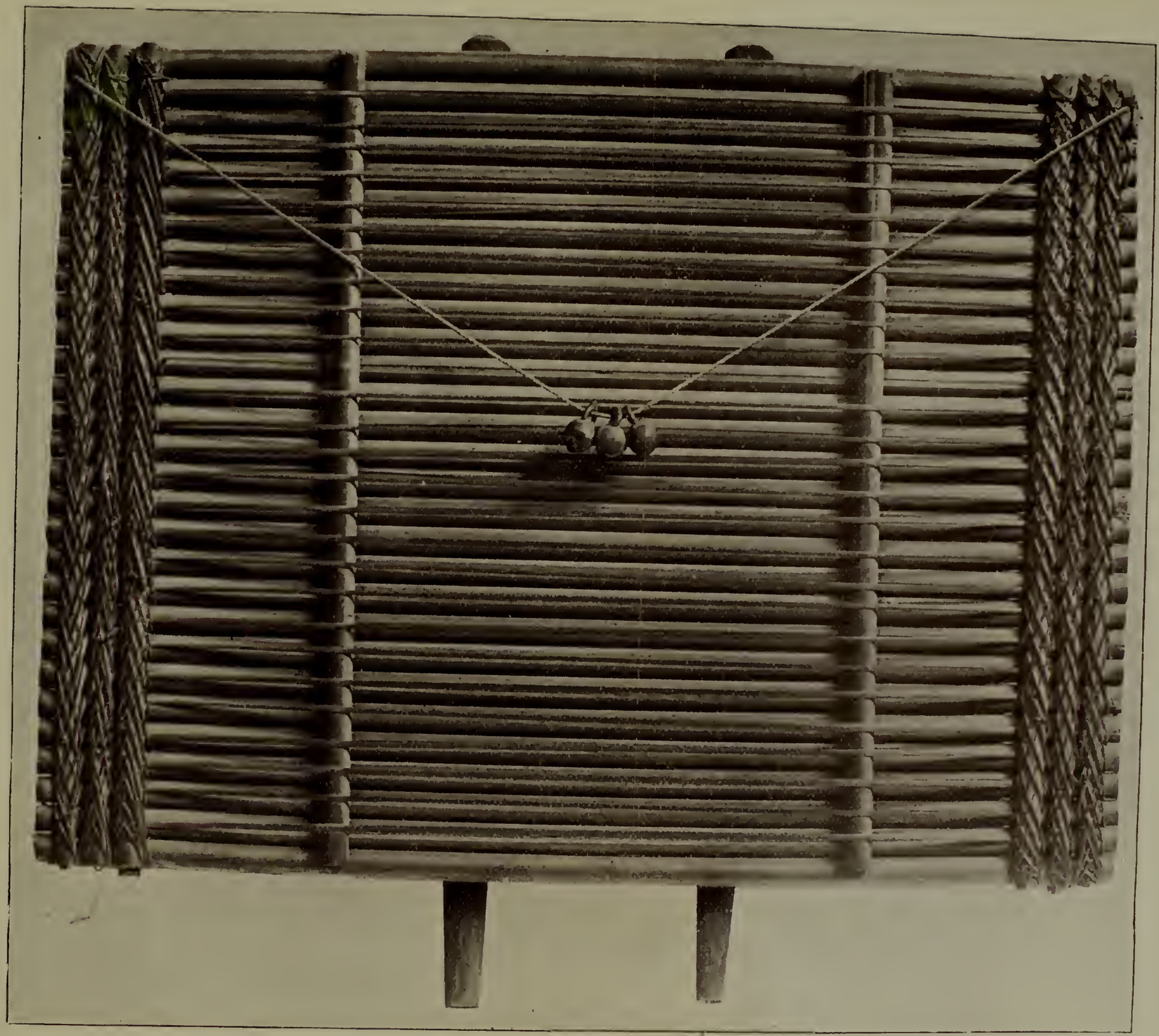
the strips, making bridges for them at each end, all the front strings sound, but the strips at the back merely exercise a counter strain against the pull of the front, and are interlaced criss-cross in threes, so as to admit a pair of tension bars, which act as required to tighten or slacken the front strings as a whole, since when unused the tension should be lowered as is the case with gut strings. The ingenuity of the construction of this instrument is admirable in its simplicity, and the work is beautifully done. All the Malagasy are expert in this braiding which to them is a fine art. The instrument is well worthy of illustration, speaking to us of the past within the present. *(See plate inserted).*

This cane-harp yields sounds bright and delicate and clear, it is held tambourine fashion over the head, and played by the finger nails of the right hand gliding at will over the strings, producing a succession of sounds rhythmical and wild, incessantly varied : four or five sounds repeatedly renewed over the series of strings, and intermingled with these, little bells strung on cords at each side, rattle against them. Imagine the native scene, groups of young girls decked with flowers, their brown skins flashing with the sunlight, dancing with the abandon of youthful vigour, in full exuberance of the joy of living, striking their uplifted harps in a wild frequency of orderly confusion, guided by instinct yet the while obeying the rules their mothers had taught them, dancing in heedless delight in the ways made imperative by tradition, rushing hither and thither, in and out, and around, weaving circle within circle, a dazzling maze of lithe bodies, of rapid feet, and laughing voices, eyes flashing as jewels, brown arms and hands swinging a cloud of harps over a restless sea of

sound,—bring to the mind's eye a scene like this, then you will understand how the multitudinous music of the ancient days, simple as were its means, satisfied by the wealth of sensuous excitement it created in young and old.

The Kings of old had a pride in the number of their trained musicians, as in the number of their horsemen and war-chariots. Music added to the pomp of ceremonial days; it testified to greatness, the throne and the temple alike demanded its aid. In the intervals when wars had ceased, the court had to be provided with music for pastime, and the people to be gratified with spectacles and feastings. The priesthood seem to have been the managers of the shows and to have held control of the music to be played, they being the men of learning; yet so far as I am aware, no record remains to tell what that music was, no indication exists, no hint even that it ever was written down, or a method of notation devised for the guidance of the multitude of players. Surmises there have been that some unexplained markings occurring in Egyptian writings have reference to musical usages, but later authorities do not favour the guesses, which have led to nothing. The temple being the focus of the musical life the music would have been chiefly of the processional kind, and the wonder to us is how it was managed unless there had been an Art of Music in force in those days, remote though they were. How did King Solomon manage his four thousand musicians?

Babylon and Nineveh have left a few slabs with pictures of musicians—that is all. In Egypt we come into the possession of a knowledge considerably wider in range than other ancient lands together have



THE CANE HARP FROM BORNEO, WITH TAMBURINE BELLS.

Fig. 59 (described page 302-4.)

yielded. Through the sacrilege of Time we have been admitted to Tombs and Temples, have shared the prerogative of the gods, seeing the hidden things and life-stories meant for their gaze only, in the darkness that to them was light. A marvellous faith. Those harps were supposed to play though no hand touched them, those pipes to pipe sweet tones that lost themselves in the silence.

Egypt bred men of great genius in the art of war, of great genius in the art of architecture, surely she must have had men great in the art of music. How were these musicians ruled? The beneficent conductor had not then been invented. In truth *one* would have been of little avail in their grand festival processions, would have been lost amidst the lofty columns of their vast temples. Not a hieroglyph anywhere to tell us how the master musician controlled his hosts "of harpers harping with their harps."

These old-world pictures speak no words; they shew us six or eight men following in a line, clapping their hands to regulate the accents and rhythm of the musicians; thus they were led, and that is all we know—may be indeed all that we are likely to know. Thus as Keats tells us, the past—

> ——— "doth tease us out of thought,
> As doth eternity."

CHAPTER XXV.

The Choice of the Greeks.

THE DELPHIC LYRE.

The fingers of the hand upon the pipes having decreed in a practical way the first scale of musical sounds, very naturally it would come to pass that an instrument with strings, in the time of beginnings, would be set to copy the same order of sounds, which, simple as it was, had an importance that held the character of law, something to be abided by. Imitation is the beginning of conservatism, all history tells us that the crudest and the most limited attainments are those that set up the sternest barriers against innovation.

When the string time came, the method resorted to for obtaining differences in sounds from strings was that of varying the lengths; next the differences gained by varying the strain upon them were perceived; and ultimately the advantages from the use of strings manufactured of various thicknesses. This last method implies the cultivation of a trade or an industrial pro-

duction of sheepgut treated for the purpose of the musical use of it. Probably the advance from the first step to the last was a slow process; it was progress, and progress is slow.

The Egyptian lyres and harps that are the subject of illustration in the chapter previous, show very clearly the custom of reliance upon differences in lengths, and strain in varying degrees, the sloping bar particularly indicating the simplest mode of effecting change of strain, but as yet there is not evidence of the practice of uniformity in the lengths of the strings of lyres. That the Egyptians had attained skill in making strings of various sizes, gauging them, in fact, to suit the positions of each, may fairly be inferred, at least for late developments in the larger harps, but not, I think, for instruments of the very early periods.

With the Greeks the contrary is the rule, they come into the temple of history ready equipped with the portable open-handed lyre, the strings of uniform length. They are late comers it is true, and derive their arts from both Egypt and Asia, and I should assume that, in this case, the particular form of their lyres was due to Asia.

It was the lyre of the strangers visiting Egypt. Fig. 51, page 293, that was the choice of the Greeks, it may have been Lydian, or Lycian, or Phrygian, or Lesbian, as thus the ancient writers named several modifications of style in lyres, but the essential design is the same in all.

We should not forget that development was going on simultaneously for thousands of years in the valleys of the Nile and the Euphrates. An instrument like that shown in Fig. 52 I consider to have been the prototype of all cross-bar lyres, both of the sloping and the horizontal

bars, the latter the latest form because, as I said, implying an industry of skill in making the strings; the original home of the prototype, Mesopotamia, the instrument working its way up into Asia Minor, a region where empires came and went, yet this type of lyre remained through all vicissitudes, fixed in the people's choice by immemorial custom of age after age.

The Greek lyre is first mentioned by Homer. His words have a deep significance of the intimate influence it had on Greek life. He speaks of the player,—

> "How he comforts the heart
> With the sound of the lyre."

In the bronzes-room of the British Museum there is a disc with a relief representing Hermes making the lyre. One lyre he holds in his left hand; another is beside the altar. The strings of both are inlaid with silver. The fable concerning the origin of the lyre in the tortoise-shell is told in many ways. In the Hymn to Hermes, according to Mr. Lang's version, it is told how Hermes,—

> "cut to measure stalks of reed and fixed them in through holes bored in the stoney shell of the tortoise, and cunningly stretched round it the hide of an ox, and put in the horns of the lyre, and to both he fixed the bridge and seven harmonious cords of sheepgut. Then took he his treasure when he had fashioned it, and touched the strings in turn with the plectrum, and wondrously it sounded under his hand, and fair sang the God to the notes, improvizing his chant as he played."

—this version is elegant, some readers would prefer to have the more literal description given by Dr. Burney:—

> "the invention of the lyre is attributed to the Egyptian God Hermes or Thoth. . . . Hermes walking along the banks of the Nile, happening to strike his foot against the shell of a

dried tortoise, was so pleased with the sound it produced that it suggested to him the first idea of a lyre, which he afterwards constructed in the form of a tortoise, and strung it with the dried sinews of dead animals."

The myth will be useful in accounting for the very frequent appearance of the tortoise-shell lyre in the classical designs of the Greek artists in their vases, bronzes and sculpture.

The Chelys or tortoise shell lyre.

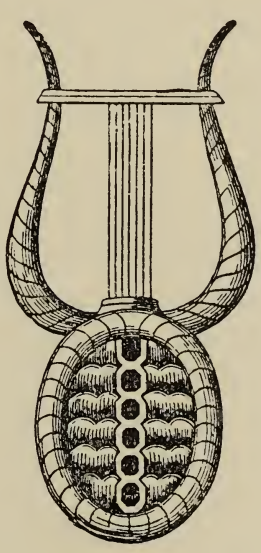


Fig. 60

This illustration will represent the finished style so often seen, with the shell and the twisted horns. The ancient artist evidently did not know how the instrument was constructed, and has exaggerated the size of the shell, and curtailed the strings, in a wise ignorance of musical effects depending upon resonance.

The Chelys (from *chelus*, a shell) is the typical form of the Greek lyre, there is no trace of it in Egyptian

paintings, they have the more primitive slant-bar style with the square-shaped body, but the Greeks coming much later in date appropriated the method of uniform length of the strings, and although we often read of "the shortest and the longest strings," the evidences of such in use are hard to find. That many-stringed lyres became accepted in certain circles of society cannot be doubted, the names of many such being current, and the extent over which the series of notes ranged being likewise stated, yet on their vases and marbles and in the best period of classic art, we find the Chelys, and the various modifications of it up to the perfected lyre in the hands of Apollo, alone thought worthy of representation. The abundance of these is marvellous, and the imagination conjures up visions of numberless treasures still waiting beneath the native soil.

Not only was the Chelys the lyre of the gods, it was also the domestic lyre ; the tortoise lyre was everywhere at home. The British Museum possesses one of these, alas, one must say, fragments of one, and reckons this poor wreck of musical feeling and devotedness (for it was found in a tomb) a rare and choice treasure. This Chelys is of sycamore and is light and of very simple make, the cross-bar is forked at each end, and so formed it slips over the trimmed points of the two uprights, and rests on notches cut on each side for the purpose ; the uprights are shaped to well-known curves and the lower ends were fixed in the tortoise shell, which covering a piece of wood formed a soundboard. Only a portion of the shell remains. The crossbar still retains the black marks made by the strings that in life were wound round it, and tightened there, that the lyre might make music to the fingers of the youth

it had comforted, and was lovingly placed in the tomb that it might still continue to comfort him.

As it lay in the case under glass, the measurements as near as I could take them were,—length of arms or uprights 15 inches, the crossbar fixing three inches below the tips of these, and extending $1\frac{1}{2}$ in. beyond, between the arms the width at the crossbar $7\frac{1}{2}$ in. increasing in the curves to $8\frac{1}{2}$ in., the shell with soundboard I reckon as about 7 by $3\frac{1}{2}$ in., thus the whole length appears to be 22 inches. The general look of it gives the idea of graceful slimness, the wood is sycamore, and the construction of the lyre so simple that it might have been home-made.

The original lyre of Apollo is of this style, fashioned in the same simplicity, a little more slim, since four strings only were at first given. Looking over the 3,000 gems in the British Museum, the bronzes, and the Sculptures, and the multitude of Vases, from earliest to latest periods, and amidst varied and ornate styles in advanced art, we see that still the same simple form remains a cherished favourite not to be displaced from the people's choice by the newer patterns, religion and tradition had made this the companion of the ever youthful Apollo, and we find that the artists kept up the association in their representations of the well-known Homeric chronicles of gods and men.

From the way in which the lyre is praised by Homer (or by other poets under his great name), it is evident that the instrument was already ancient. Olympus the elder, and Orpheus the Thracian, were centuries earlier than Homer; two centuries later Terpander comes into recognition historically, and his lyre had but four strings when he gained the prize in his first

musical contest at the feast of Apollo in Sparta, B.C. 676, so that from these dates we learn that for many centuries the lyre had remained a simple instrument of four strings, producing but four sounds. Some say that these elder musicians limited themselves to three strings, and that one Linus by name it was who added the fourth string. However Terpander as he grew in renown became dissatisfied, and greatly daring increased the number of the strings to seven. Cleonidas in the *Introduction to Music* (ascribed to Euclid), has preserved for us two lines from a poem by Terpander himself, which Mr. Wm. Chappell translates as follows:—

> "But we loving no more the tetrachordal chant
> Will sing aloud new hymns to a seven-toned lyre."

Sappho used a lyre of six strings, Pythagorus about B.C. 520 added an eighth string, Phrynis added a ninth, Anacreon a tenth, his lyre was supposed to be a Lydian *magadis*, capable of so dividing the string in playing that by an intermediate bar, against which each string could be pressed, octave sounds could be given; then we hear of Timotheus (the younger) in B.C. 446 adding four strings to the Spartan lyre, an audacity which was so great an affront that the Spartan Ephori cut away the four strings, confiscated the lyre and suspended it in the temple as a warning to all innovators, and there it was to be seen by citizens and by travellers in the round building known as the *Skeias*.

Concerning these inventions there are other claimants, and many conflicting statements; the legendary lore also comes in to the confusion of dates, Hermes the old Egyptian God is one of the reputed inventors

of the lyre, and he furnished it offhand with the *seven strings* obtained from the land tortoise, so that chronology is a hazardous topic, baffling the most patient of investigators. The Egyptians themselves only admit of three strings being in the original invention, these representing the three seasons into which their year was divided.

The instrument has many forms, little differences in structure giving rise to new names. The Phorminx, Cithara, Kitharis, Chelys, Barbitos, Psalterion, Trigon, and numerous others ; the principle being the same in all I class them under the general term, lyre.

The information given to us in ancient treatises on musical matters affords very little light upon the structure, manipulation, tuning and other details which we in these days are curious about. It is indeed difficult to arrive at reasonable conclusions, having, in default of the actual examples of the Greek Lyres, to rely upon artistic representations often, as we notice, conventional only, as in our day, for artists are ruled by the eye, and seek little beyond appearance ; hence fixed types suit them, and this sufficiency accounts for the absence of representations of many instruments which we know by verbal reference alone.

How were the instruments strung ? How were they tuned ? How played ? The utmost obscurity clouds these enquiries.

In order to show the steps in development that took place, I have selected a few illustrations, each change, no doubt had a purpose although there is no record left to enlighten us. The writers of the ancient treatises on music busied themselves with scholastic subtleties concerning scales and tetrachordal divisions, and if they

were musicians, perhaps were as indifferent as our composers and musicians too generally have shewn themselves to be to the practical comprehension of the nature and construction of the instruments they used. Much that was written we cannot understand, probably because the terms they used had to them meanings and associations of ideas other than those obvious to modern interpreters. The makers of lyres and the skilled players, those who knew the things we would learn did not write, and the writers who did not know,—they explained things, or undertook to do so, which is another matter, and the consequence is that no man at the present day can speak with certainty upon the most interesting questions connected with these Greek instruments.

Seeking amongst the representations on vases and gems for hints of design and purpose, questioning each one, saying, what can you tell me? I one day found my attention directed to the marked distinction between the ornamental ends of the cross-bar of lyres, how that the designer had drawn the end projecting at the right hand much larger than the end shewing at the left hand. Surely, I thought, that feature in construction indicates handling for some practical end; what can it be but that the cross-bar has been converted to be used as lute and lyre pegs had previously been used—it could be turned.

Then, the eye, being prepared to see, was quickened to observe; I looked around and found so many instances in which this particular distinction of the right hand from the left was dominant in the construction, that the conclusion arrived at was confirmed. The advantage given to the players right hand was that

of a better grasp in turning this long peg, evidently the peg by intent fitted very tightly.

Now arose a point of great difficulty. Here was a peg a long bar carrying seven or eight strings, and if its office was to tune the strings, the twisting of the peg would affect the whole series simultaneously, an extension of its office certainly, but in like degree a limitation of its powers. It appeared to me upon close consideration that only a partial twist was allowed to it, and that

Terpsichore with a Lyre. *Fig. 61.*

the intention of it and real purpose of it was to guard the strings against breaking, which would be likely to occur if the strings were under constant tension, subject at the same time to changes of temperature and of moisture. Thus each string would be strained to its desired pitch, and fixed at the bottom holding, and when the instrument was set aside after playing, a slight turn of the peg would slacken the whole series, which again would

be tightened, when required, by a partial turn in the opposite direction.

Fortunately there exists a monument which will greatly help us in understanding the practice of the lyre, for it shows us the player in the act of tuning her lyre by this cross bar-peg. The central figure is dancing and playing at the same time, and we should notice the band by which it was the custom to support the lyre

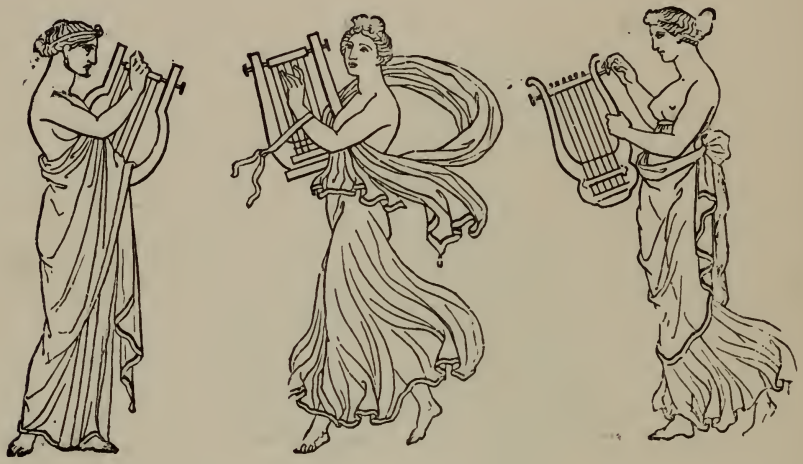


Fig. 62.

from the left arm. The figure to the left of the engraving has already had her dance and is readjusting her strings which have been disturbed in pitch by the plucking of the fingers; the figure on the right is preparing for her turn and is tightening the strings ready for playing. This illustration (*Fig.* 62) was given in "Hope's Costume of the Ancients," a work published in 1812, the subject of which did not promise anything for

music, but it is a bit of treasure trove very important in the elucidation of the art of the lyre. That block appeared in Nauman's History of Music, and perhaps is passed by with but a casual glance from musical readers.

Erato with the Psaltery.

Fig 63.

The lyre held by Terpsichore (*Fig.* 61), shews a variation in construction, it has below the cross-bar a second bar which would seem in itself to be intended to define more strictly the lengths of the strings when the peg carrying the series were fixed in its correct position, but an examining the larger lyre or Psaltery (*Fig.* 63) carried

by Erato, "the lovely one," as the Greeks called this muse, this addition will be seen to assume a more important relation, and the appearance is as of platform attached to the crossbar through which the strings are threaded, and they do not pass to wind round the bar. This platform is more or less a puzzle. It might be designed to throw the strings more forward of the body of the instrument ; Erato's lyre is curved evidently with that purpose in view. Many representations shew this little platform. I have noticed instances of the loose ends of strings shewn above it, although the rule seems to have been for those ends to be at the bottom of the lyre where the tuning of each string was regulated. Erato's lyre is of advanced pattern, being hollow like a violin, and doubtless it was of high sonority.

In the gem room of the British Museum there is another painting from Herculanæum, in which a new idea is manifest ; the platform is replaced by levers at right angles to the bar to which the strings are attached. M. Victor Mahillon gives a rough drawing of this, but it is hardly convincing as to how such levers or rollers can be brought into use. I have brooded over this painting, searched it intently with opera glasses, seeking time and again to read its mystery, and still it is clouded in mist, the actual construction not to be made out.

There are several illustrations of lyres having a number of loose rings upon the bar ; Dr. Burney gives one where one long string is threaded through a series of them from top to bottom of lyre. But the idea is an impossible one for practical validity, since the tension could not be regulated to differ for each note, and the string being continuous from one to the other, to affect one note would be to affect all.

Rings and loops on the bar are often seen, details of strings being omitted, and there is doubt how much the painter knew of the instrument he presumed to depict; modern artists shew themselves equally presumptuous, seldom or never caring to know or to enquire into the mode of playing, or to understand the design of the construction.

Some little light, I think, is given in a description of an ancient lyre which, in a mutilated state, was recovered by Lord Elgin from a tomb at Athens.

"It was in fifty pieces, but the fragments could be so put together as to leave no doubt of its figure and action. The wood is of cedar, and in size similar to that held in the hand of Apollo. Having laid in the earth about three thousand years, it was surprising that the woodwork was not all decayed, for the metallic parts were completely dissolved. This lyre evidently had eight strings, from the number of little rollers which had turned upon the cross bar. On each roller there was a small projecting peg, upon which the string was looped; and then by turning the roller it was raised in pitch, and the mode of fixing it was by slipping the end of the roller, which was notched, upon a fastened piece of wood of corresponding shape."

This clearly was a clutch method, and a fairly good mechanical invention, and possibly some details are wanting, if fine tuning according to our notions was required; and we are led to suppose that the Greeks were very exacting about pitch. Yet for all the ancient writers tell of subtle divisions of tones, I have my doubts of the practical exercise of discrimination of pitch to the imagined degree of sensitiveness of ear, generally assumed to be a natural gift of the people of Greece; the instruments were not fitted with sufficient mechanical exactness to produce and retain such fine distinctions.

Another advance in lyre-making consisted in the

adaptation of a projecting box affixed to the front of the larger body of the lyre; this was an Egyptian invention, for which, see *ante* Fig. 56. The strings were attached to this little box, and it is probable that within it there were means for tightening and relaxing the tension of each. This was also a useful device for bringing the strings forward from the face of the instrument. Let us hope that some forgotten tomb still holds a perfect lyre in its keeping.

Greek writers make mention of lyres of many strings, with strange sounding names, but examples are rare of such, indeed they are more Asian than Greek. Pompeii and Herculanæum have preserved for us pictures of some, but the period is late.

There is an instrument which may stand as a representative of the many stringed, and as indicating the class of so-called *Trigons*, almost letter D shape. It is depicted upon an ancient vase in the Munich collection (Fig. 64). It is supposed to be in the hands of Erato, she holds it against her left shoulder, not as is the custom with our modern players of harps, resting on the right shoulder; obviously the custom in each case is the one best suited to the convenience of the player and to the different demands upon the instruments in ancient and in modern use. The vase is Etruscan, but the lyre is Egyptian in origin and Asian in style, witness the leopard skin spread upon the seat. The artist was at fault in his drawing. The lyre is of the Egyptian model, the bulk or thick portion of the boat-form being thrown upward above the shoulder, and this as a sounding-board should have been made plain. This particular development of style I should surmise to be Lydian, or perhaps, more southern in origin, possibly Assyrian.

Plato and Plutarch both comment upon many-stringed lyres, condemning their use and advocating a

Fig. 64.

return to the ancient simplicity. Old Pausanias, who wrote at a much later period "a Description of Greece," shews himself familiar with the many-stringed by a

simile he uses, stating that "in Egypt he had seen the pyramids, had beheld with wonder the colossal statue of Memnon at Thebes, and had heard the musical sound, like the breaking of a lyre string, which the statue emitted at sunrise." The breaking of strings is thus known to be an old-world trouble, and no doubt Pausanias had often heard the sound, else this reference would not have come to him so naturally as a fitting illustration ; only a large or many stringed-lyre would give a noticeably musical sound ; an instrument with short strings equal to our violin strings would give but a brief snap, not in any degree a musical sound. Desiring a personal experience I suggested to a friend a realistic test, and he kindly strained a string of his violoncello to breaking point. So we knew that the sound heard in this catastrophic incident of to-day, was certainly not of the nature that the great travellers of past days were attracted to as one of the wonders of the world. A many stringed harp somewhat of the capacity of modern harps would, however, under the shock communicate a thrill over the whole range, finding out a sympathetic resonance from vibration of those strings that happened to be in accord with the pitch of the sounding-body, and this kind of response on the breaking of a string was probably that which furnished old Pausanias's memory with so pertinent a simile. Whoever has heard one of the higher pianoforte strings break will understand fairly enough the nature of the sound. The statue was 69 feet high, and it was reared by Amenhotep III., about 1450 B.C.

With testimony so absolute from an ear-witness, the Memnon is no fable. Silent that voice has been through many centuries, yet we may well believe that

in older days, ere time had worked its inevitable changes, the sounds heard were in resemblance more truly vocal; and although then mysterious to hearers, now under science such musical vibrations are easy of explanation as a natural phenomenon.

The wonder-inspiring statue is still seated there,

"moulded in colossal calm,"

looking across that desert-destined land which remaineth for ever, as Shelley named it,—

"a desolation deified."

Seeking an example of Apollo's lyre, as it existed when Greek art was at its highest period, I found it, I think, in a marble relief carved by the hand of Praxiteles; it is an authentic witness of the form of the lyre in his day, and it seems to carry out the description given of the lyre discovered by Lord Elgin (see page 319). The artist gives a representation of the lyre as he saw it, and as no doubt used in the worship of the ever-youthful Sun-God.

This marble is in the National Museum at Athens. It was found at Mantinea, in Arcadia, and it represents the contest of Apollo and Marsyas; Apollo on the lyre and Marsyas on the flutes, or double pipes. The marble has been finely photographed by the well-known M. Rhomaides, of Athens, an enthusiast in his art. I copy this for the Apollo; the quiet dignity of the seated figure is remarkable. According to proportionate relation, the instrument may be estimated as being about twenty-six or twenty-seven inches in height, and the acting length of the strings about eighteen or twenty inches, the frame about two inches deep,

with the interior hollow, so that although the strings should be only plucked by the fingers, the instrument we should expect would give a good and a rich resonance. The strings, seven in number, being each tuned separately by their rollers or rings.

The Apollo lyre was the nursling of the Greeks, never absent from the Greek life; present in the home and in the temple, heard in the green meadows, and upon the mountain-side, and by the sapphire sea, gladdening the heart at household feasts, and inspiring the voice on the great days of rejoicing.

Those vast processions carved upon marble friezes speak to us of an existent life when to the people Apollo was "an evident god"; days when through the shaded valleys, and along the terraced mountain-sides, young men and maidens with dance and song made a delighted way,—

"touched piously the Delphic lyre,"

and to the sacrifical altar eager throngs pressed onward and upward,—as in his word-magic Keats pictures it;—

"with trumpets blown
Of triumph calm, and hymns of festival,
Voices of soft proclaim, and silver stir
Of strings on hollow shells, ...
. . . . . and the mysterious priest,
Leading that heifer lowing at the skies,
And all her silken flanks with garlands drest."

That busy stir of life has gone past, faded now into the viewless air, to be seen no more by man; the dryads and the naiads, the satyrs and the fauns left their dedicated haunts, and the muses too all vanished, all hushed silently away, what time the,—

"great Apollo
Let his divinity o'erflowing die
In music, through the vales of Thessaly."

The fateful land remains as of old, remains unchanged through milleniums of change,—the traveller to-day may see the lofty Delph glistening white with snow and great Parnassus towering high above it; may visit grand Olympus, find the goats browsing yet upon Mount Helicon, watch the bees gathering honey from the creeping thyme upon Hymettus, or stop to gaze on the wonderful purple glow that comes over it at evening light; Hippocrene, faithful to its ancient renown, runs cool and bright, that whoso will may drink therefrom and pause to meditate on Time's concurrent freshness, ever-passing: the ear is charmed with sounds, the winds waken the soft susurrus from the pine-forests on the heights, it wanders down the pathways of the hills to mingle with the drowsy hum of bees, and the tinkling of the goats bells, and with luscious song of hidden nightingales in pale green olive groves. The land we look upon is the same; it is man's world therein that has changed, sadly changed. From the white mountains to the valleys, ruin calls to ruin; linger as you will in shade or sun,

"Round every spot where trod Apollo's foot,"

his music is now unheard,—in his own land his lyre unknown.

CHAPTER XXVI.

How the Music Grew.

IN THE DAYS OF A THOUSAND YEARS.

"Most things in Greece are subjects of dispute," so wrote Pausanias, and his word for it may be accepted freely. As it was in his day (writing in 174 A.D.) so it is in ours; learned authorities so differ on simplest points that the wayfarer asking questions has no little difficulty in deciding whom he shall heed, whose directions he should follow.

The evolution of the musical scale should be of interest even to musicians who would not make the subject a study. How step by step our diatonic scale developed, how it has become what it is gradually by slow degrees—does anybody know? Certainly. Wise men in their libraries find much; the erudition is deep and they can expound it in their own way, but it is the way for the plodding student, not intended to attract the general reader. Moreover the wise men do not agree, and the wayfarer in literature after reading

many books fails to obtain the clear account which he has been seeking. Having had occasion to go into the matter of the Greek system on the historical side, I saw how confused it was, and how necessary to examine author against author, to try to arrive at some orderly assignment of steps and changes made in those distant times, and to endeavour to bring home to the mind the conception of a chain of historic facts.

Traditions embody general beliefs in stated facts, or supposed facts, and history makes record of these, giving to them more or less credence. The statements concerning the earliest developments of the Greek scale are based upon traditions, since it was not until after the lapse of many centuries that anything was written.

The recorded periods of civilization that held good in ancient chronology have many of them been displaced by the newest explorers, whose work within the last few years has been prolific in discoveries affecting calculations of the relations of time in the past. The dates I adopt will therefore have to be considered authentic only so far as the learned choose to agree concerning them.

Old historians stated that Athens was founded in 1556 B.C. by Cecrops, who led a colony from Sais, in Egypt, and established the kingdom of Athens. Neith, or Nit, was the deity of Sais, her name also was Minerva, the patron goddess of Athens. In less than fifty years after, Danaus, who was accounted a brother of Amenhotep III. (by some Egyptologists called Amunoph) left Egypt 1400 B.C. and founded Argos, of which he became king, and died 1425 B.C.

These are highly important dates in the perspective of history. Egypt, through the wars of Thotmes III.

and the later expeditions of the Amenhotep Pharaohs, had been raised to the height of empire ; Mesopotamia and Syria had been brought under her rule and her armies were constantly traversing and retraversing that extensive region tributary to her (known now by us as Asia Minor), reaching along that coast of the Mediterranean and even to Cyprus, Crete and other isles.

By a few touches of history and a chain of dates, it may be possible to bring before you life as it was, to excite your imagination to realise in a broad view the state of the then known world, when in all that vast territory, the high civilization to which Egypt had attained could not have failed to influence the daily lives of those myriads of peoples, busy with their tradings, and little ambitions, and religions, and domestic wants, and pleasures. It was a very composite population, tribes, clans and races, or by whatever names we class them, full of jealousies and antagonisms, only held in abeyance from fighting by the prospect of greater gain by trading with one another.

The musical instincts of the whole of these peoples probably followed one channel common to all, their music differing but little from what we call "folk-song" ; and even varieties of language need not have raised barriers in musical feeling, as the instance of the Song of Linus referred to by Herodotus (see pages 63-4 ante) clearly shews.

The truth is that the founders of Athens, and Argos, and other great cities, were leaders of bands of military adventurers, and these when they left Egypt took with them the common popular music such as themselves and their families had been accustomed to, they had

no need or use for any other; we should not expect of them that they would represent the musical culture of the motherland, already so highly developed. Hence the simple tetrachord of ages past, produced upon their reed pipes, satisfied them for all that they sought, it was their system of music, and had not been extended. In the early state of the music of the Greeks there had been a double influence, the Egyptian influence, and the older Asiatic influence, both as I imagine proceeding from the same Mesopotamian source in a remote age.

We have to remember that there was a prehistoric Greece and an older Mycenœan Greece. Of Athens, we should say "the refounding," for there had been five "Athens," each city built upon the ruins of a former one. "Athens," says Mr. H. R. Hall in his book, "The oldest civilization of Greece," has existed as an inhabited place from the earliest post-neolithic times, perhaps before 2500 B.C. to the present day," a fact that may be very usefully recognised, it bears with it an important value, reminding us that an immigrant people almost invariably displaces earlier peoples, or absorbs them. Might ruled then, as now.

In the realms of myth and legend the chief progenitors of music appear; Pan and Apollo, Mercury, Athene, and others; then tradition brings forward many names of poet-musicians who, it cannot be doubted, veritably existed in the flesh. Certain dates do not seem to be questioned, although they are prior to the Trojan War, which is supposed to have taken place between the periods 1500 and 1200 B.C. Homer himself being given a date about 900 B.C. In musical history as generally found, little is noted before Terpander 700 —650 B.C., and it is assumed that up to his time

only a four-stringed lyre had been in use by the Greeks; it is as if there had been averred a stagnation in music for many centuries.

A closer investigation, however, must cause a revision of such a conclusion, and I repeat, it may well be that we should think of Greek music as having had two courses of usage, running parallel, even as in our own history. These are not as opposed but as distinct, the temple or academic music very strictly conservative, and the popular music with its mingled Asiatic influences, inherited, and untrammelled by priests or philosophers. Very naturally it would come to pass that literature occupied itself with the orthodox and academic views and systems of music, even as by learned musicians our ecclesiastical music has been regarded with almost exclusive attention, whilst the old English songs and ballads have, as it were, existed upon sufferance, kept in being by popular feeling and tradition.

If this twofold strain in the origin of Greek music is borne in mind I believe it will solve many difficulties that constantly trouble enquiry, and will reconcile conflicting accounts given by different authorities, for there is very much that is vague even in the originals, and various translators have but added to the confusion, because they in default of understanding the subject, too often became dogmatic upon guesswork.

Tradition comes upon fairly solid ground with Hyagnis about 1506 B.C. and Marsyas his son, and Olympus the elder, his pupils. Musæus the Athenian, 1426 B.C. was taught by Orpheus and was chief of the Elusian mysteries instituted in Greece in honour of Ceres; his hymns were used in the celebrations.

Orpheus also taught Thamyris, and Linus, who taught Hercules, and Amphion, and so on. Then there was Thaletes, the poet-musician mentioned by Strabo, whose old pæans Pythagoras loved to sing ; he lived about 300 years after the Trojan War. Other names might be recalled but these suffice to shew that amongst the people of the various Greek States the art of music never at any time was without honour and esteem.

The musical system of the Tetrachord having become known to us through the writings of certain Greek philosophers, fragments of which had been preserved by authors of later centuries, has therefore been assigned to the Greeks, and the development of this musical system has been recorded only in their language, yet the origin of it has undoubtedly to be placed long before the time of the Greeks. Possibly with good reason it might be claimed for the primitive Akkadian, as found by him in the finger holes of the simple reed-pipe.

Although there is clear evidence of the early existence of the tetrachord in pipes, the attention of philosophers has always been given to string instruments, pipes having had no share in their regard, possibly because the playing of pipes was a professional art in which good training was necessary, whereas any philosopher could twang strings and discourse upon laws and proportions.

The lyre of Mercury, so tradition asserts, had three strings only, tuned as

e——*a*——*e*, or, *e*——*b*——*e*,

thus comprising fourth, fifth and octaves according to our terminology, though doubtless the god was ignorant of such things. Emerging from the mists of fable we

arrive at traces of a period at which it is said the octave became disused, and nothing remained but the fourth in its rudimentary condition, divided next into two steps, and after that separated in three divisions resulting in an interval comprising two tones and a lesser tone, or two steps and a half, so that the whole is marked by four sounds; this series was then undesignated, but after a time a stage was arrived at when it *was* designated, and known thereafter by the word "tetra" signifying "four" and the inclusive system was called a tetrachord, and therefore the commencement of the evolution of a musical scale.

The ending of the word in "chord," has given rise to the notion of a chord as of harmony, and again of cords as another name for the strings. But these are misconceptions, the meaning of "tetrachord" is, a series of four sounds, in an order of succession so that the extreme sounds comprise a fourth. The terms fourth, and fifth, and octave, are quite artificial, are signs founded on *vision* or the counting of the strings of the lyre; the fourth in music is not a fourth part of anything, is not a fourth part or proportion of the octave, it was called by the Greeks "diatessaron,"—*right through* or *over, four.*

One most ancient form may be represented thus, considering the extreme sounds to embrace the interval,—

e⌣*f*——*a*

it was the initiatory stage afterwards completed as,—

e⌣*f*——*g*——*a*

only that it should be read from right to left, because

with the Greeks the reading was from the high note downwards thus—

a——*g*——*f*⌣*e*

to us occularly confusing, yet it was the way of Greek thought.

(The sign——indicates whole tone, and ⌣ semitone).

The man's voice was the guide, and from time immemorial the *a* has been the standard of pitch, by ruling of the ear.

(The *A* below middle C, top line, bass clef).

From father to son, from teacher to scholar the tradition of pitch was carried on. The string affected by heat and moisture and by the strain when twanged, never remains accurately to pitch. Although pipes and strings have run a parallel course, we do not find that the lyre players actually cared to refer to pipes as guiding them in setting the pitch. Yet it was the custom, so Plutarch tells us, for *reciters* and orators to have a pitch pipe sounded by an attendant to keep their voices to a prescribed pitch, and he mentions an ivory pipe being used for the practice. On the contrary it would seem that from the earliest times lyrists of all sorts, and players on stringed instruments of every nation, even up to the present day have found the habit of the ear sufficient for the purposes of their art, that indeed to the soloist, the musical ear relies upon itself for tuning.

By the Greeks music as an art was regarded as an aid to regulate by rule the inflections of the voice, to mark the places of emphasis and to define the pauses in the recitation of their epic poetry; and the rhythm of their

songs followed strictly laws that had been laid down, innovation was reprehended, and even prohibited. The lyre itself was held subordinate to the voice, accompanying it and filling in the pauses according to a conventional fashion, which the hearers judged, critically and keenly.

We import our modern ways of speech upon musical subjects into the considerations of these matters, and necessarily so, but it is essential to a right apprehension to remember that the Greeks had no way of naming the sounds except by certain names given by them to the strings of the lyre, thus the forefinger string was called "lichanos" and the others had their distinctive appellations. They had no sense of a *tonic* as we have, no system of harmony, no musical stave, no use of letters, a, b, c, etc., to denote their music. In late times they devised a kind of letter-note method, curiously crude yet elaborate, of letters standing upside down, letters lying on the side, letters mutilated and signs for instrumental sounds different from those for the sounds of the voice, altogether 1,062 varied characters are stated as used, and this knowledge of their written music was by the merest accident preserved to us in a solitary manuscript, by Alypius, 115 A.D.

The only date known in the life of Terpander was the year when he gained the prize in the competition for singing, B.C. 676, at the Pythian games; some say that he also won at four festivals in succession. He may have been known to that Demaratus, mentioned *page* 68 ante, as the date connects them as contemporary. Some time later than this victory he is credited with having increased the number of strings from four to seven, but statements upon this question

are very conflicting. Helmholtz says that he added but one string to the Cithara of six strings.

According to some ancient writers Chorebus, son of Altis, King of Lydia, he it was who commenced innovation by adding a fifth string. Hyagnis, who in the sixteenth century B.C. invented the Phrygian mode, added a sixth string; Terpander a seventh, and Lychason an eighth; but Pliny says, Terpander added three strings to the orthodox four, that Simonides added an eighth and Timotheus a ninth. Anacreon as before stated had ten strings, and Timotheus increased the seven strings of the Spartan lyre to eleven. Pythagoras, by equal authority, was the reputed father of the eight-stringed lyre.

Through the maze of such traditions (and other statements I could quote, increasing the intricacy for the benefit of research) I have had to make my way, and decide as best I could, upon a line of connected record.

So, pending an alternative view to be offered presently, I elect to follow Pliny and allow to Terpander the claim to the increase of the scale of the tetrachord by a trichord above *a*, the highest sound of the four-stringed lyre.

Our scale system is based on a *tonic* sound, and we read upward, but the Greeks in their music thought downwards, and by the laws, the tonic was, in the structure of tetrachords, barred out, for the *a* was the master tone, and between it and *g* no semitone was allowed, though what necessity existed for this essential feature of the formation, no explanation is apparent.

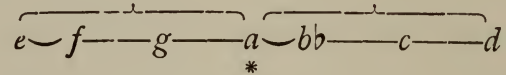
The three sounds above this formed with the *a* another tetrachord, *conjunct*, as it was termed.

	d	
		tone
The		
Added	*c*	
Trichord		tone
	b♭	
	)	hemitone
	**a*	
		tone
The	*g*	
Original		tone
Tetrachord	*f*	
	)	hemitone
	e	

Continuing to plot out the scale on a vertical plan would not be of any advantage. The habit of the eye would perhaps require a diagonal line of ascent; I think, however, that showing the growth of the scale on a level line will best suit our general convenience.

This then let us call the Terpander scheme for the scale to which the *seven-stringed lyre* or Cithara was tuned. As we shall see, this became the classical lyre of Apollo, throughout the glorious period of Greek Art.

e⌣*f*——*g*——*a*⌣*b♭*——*c*——*d*
*



The *a* I have marked with a star. It was called the *mese* or *middle-note*, was considered the master-note of the lyre, and was compared to the sun as being the centre of the musical system. The original names of the strings of the four string lyre are lost, but it is quite obvious that until the extra three strings were introduced there could have been no *mese* or middle string, so that the name originated with this condition, with this perfecting of the system.

Before systems exists methods and rules have sway;

and out of these methods and rules systems are constituted. The great poet-musicians renowned in the land, in teaching their successors in art according to their own practical experiences, and teaching *viva voce*, no doubt insisted upon the observance of certain methods, and laid down rules which on their authority as chief masters, became the traditions of the profession.

The great repute of Terpander would have caused him to be regarded as one who spoke with authority, and I have sometimes thought that discrepancies in the accounts given by different authors, who wrote many centuries after the time of this musician, and from whom alone we have any knowledge of the doings in such early period, might be reconciled by the surmise that perhaps it was Terpander who first showed how the two tetrachords should be disposed and the tuning of the enlarged series of strings be regulated in the best way for the art of music, so that instead of being left to the caprice of different teachings, an uniform method should prevail. Some one in authority by his recognised supreme skill, would have been necessary to reduce to order the practices of the day as taught by the wandering minstrels in the land of Greece, and in the numerous settlements in Asia Minor, and it seems reasonable to suppose that Terpander may have been the first to formulate definite laws for the structure of the tetrachord in Greek music.

Very binding indeed were these laws, and they have exercised an important, indeed, an imperishable influence upon the musical art in all the centuries that have followed.

The methods of the great master-players of the cithara were in course of time resolved into forms, very

simple they were and very definite. These are the laws of the tetrachord :—

1—between the two extremes of the strings of the four-stringed lyre there shall be a consonance in sound called a diatessaron.

2—between the string the highest in pitch and the string next to it lower in pitch there shall be a separation in the sounds equal to not less than one full tone.

3—between the third string (reckoning from the highest) and the fourth string there shall always be a separation in pitch equal to one hemitone.

There remained therefore the neutral ground between the second and the third string—equal to a tone—but variable, according to the selection of a maximum beyond the "*not less* than a full tone" affirmed by law 2 ; there might be two full tones in succession, or the upper might be increased at the expense of the lower, or on the contrary the lower might part with some of its own fulness to increase the hemitone.

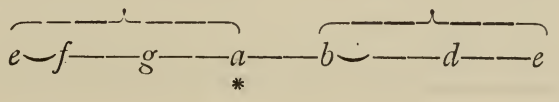
We should not imagine a written law at that early time ruling the craft, the oral tradition would be sufficient.

Giving an account of the growth of the scale, I have put the matter in my own way, in words, that as I think, will best fix the attention of the general reader. Evidently for many centuries the orthodox Greek lyre was restricted to four strings, notwithstanding the popular adoption from time to time of an increased number of strings according to the prevalence of Asiatic influences.

A time however came when authority accepted an

increase to seven strings. Whether Terpander, or Archilocus, or Tyrtæus, or other poet-musicians got the innovation accepted is a question that will remain unsolved ; hearsay or history favours Terpander. Terpander let it be.

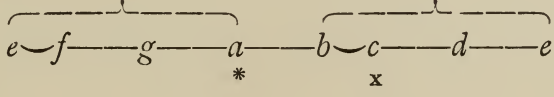
Olympus, who was a Phrygian, and—about 630 B.C., brought asiatic flute music into Greece,—changed this as follows, and obtained the octave on the seven strings.



Notice particularly the interval *b*——*d* as it plays an important part in the history of music. It was a flute-pipe interval, older than Terpander. Olympus was the first to introduce the disjunct form, and from *b* to *e* he compasses a tetrachord.

Olympus was a contemporary of Terpander, and we may consider that the two scales were in favour at the same time, one as the orthodox and the other as the secular system.

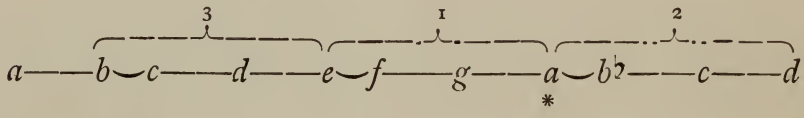
Pythagoras about 530 B.C., added an eighth string, and it is evident that the string he introduced was that of the missing *c*, since, as to extent, the octave already existed on the lyre.



Therefore two complete tetrachords, but *disjunct*. It is plainly to be seen that he wanted a fifth to the *f*, to make his scheme of fifths perfect. It was a marked

advance. The doings of Pythagoras with the monochord though of great interest, need not be told here, as they belong to another branch of investigation, to be treated subsequently.

Ion of Chios, about 430 B.C., enlarged the scale of the lyre to ten sounds, and was the author of the Conjunct or Lesser System complete. It consisted of three tetrachords conjoined and one note added, to complete the octave below, from *mese* the middle note *a*. Greek names would bewilder, and it will be the best plan to keep to the method of distinguishing the notes by letters.



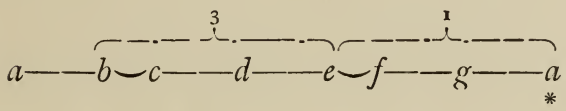
Notice the return to the Terpander scale with the *b* flat. I have seen the addition of the three notes below *e* attributed to Terpander, but considering the period the statement is not convincing. The eleven notes here given may possibly be those of the Lesbian lyre of Timotheus the celebrated poet-musician who according to Pausanias excited the Spartan censure (mentioned page 312 ante), by his eleven strings. The low *a* first seen in the system was called the *proslambanomenos*, meaning a note taken into the scale to complete the octave.

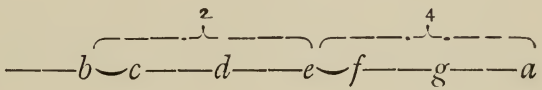
This was the state at which after two hundred years the Greek scale had arrived. After Ion there came a period of controversy.

Archytas, 400 B.C., challenged the Pythagorean third, which was extremely sharp, and he was the first to shew that *c——e* should bear the ratio $\frac{5}{4}$.

Aristoxenus 350—320 B.C., a pupil of Aristotle, disavowed the whole Pythagorean scheme, and the philosophers ranged themselves in two opposing schools, the Pythagoreans who determined intervals by proportional numbers, and the Aristoxenians who relied upon the judgment of the ear.

Somewhere in the period embraced by the lives of Ion and Aristoxenus, for it was a period of high intellectual activity with the Greeks (Sophocles, Pericles, Plato, Aristotle and other famous men were living), somewhere we have to place the Disjunct, or Greater System Complete. It consists of fifteen notes,—





then there was an alternative arrangement ultimately admitted, making conjunction at *a*, allowing *b* flat instead of *b*, causing that tetrachord to end on *d*, and placing the tone of disjunction between the *d* and *e*. Very noticeable this as shewing how popular feeling hankered after the old way of Terpander. This later arrangement of the Greek scale, comprising the two octaves, comes to us from Euclid's reputed treatise on Music, now attributed to Cleonidas, writing about 120 A.D.

Thus was the scale completed. The order of the growth of the scale is shewn by the figures, 1, 2, 3, 4 over the several tetrachords.

CHAPTER XXVII.

At Alexandria.

THE FINAL SETTLEMENT OF THE SCALE.

The structure of the Scale so far as was necessary for the development of the Greek modes was comprised in The Disjunct or Greater System Complete; yet at various times the extent of the diatonic scale by degrees was increased, tetrachord was added to tetrachord until in the days of Plato its compass was stated to have been made to comprehend four octaves, a fifth, and a tone.

Archytas and Aristoxenus were both of Tarentum, a noted Greek colony in Southern Italy, founded by Sparta about 705 B.C. Archytas was a contemporary of Plato (*b* 429 *d* 347). The period was one of artistic luxury, the Parthenon had been completed, and Greece had her golden age of Art, Science, and Philosophy. Here Praxiteles, the great sculptor, second only to Phidias, comes upon the scene, and we may with confidence accept his design of Apollo's Lyre as a true

representation of the instrument as it existed in his day, and, it may be assumed as used in Apollo's Temple, and by the master-musicians. The date of this sculptor has not been ascertained precisely, Prof. E. A. Gardner gives in a guarded way 400 B.C.

Aristoxenus was a musician, the son of a musician, he came at a time when great mathematicians were engaged in battle over fine distinctions in Pythagorean systems, to them of superlative interest and importance. Aristoxenus opposed the Pythagoreans and held that "it was absurd to aim at an artificial accuracy in gratifying the ear beyond its own power of distinction," a decision very natural, coming from a musician. He was a great writer and theorist, wrote it was said more than four hundred treatises, all of which have been lost except three on "Harmonic Elements," and this is the oldest musical work at present known.

In those years from Archytas to Aristoxenus the evolution of Greek music had passed from the poet-musicians, the real masters of the lyre, into the hands of philosophers and disputants, men learned in all the subtleties of Pythagorean lore, who busied themselves with recondite demonstrations of the proportions of numbers, and applied them to the theoretical division of the octave, to an extent which transcended altogether the range of the practical art of the cithara players, nevertheless the labour was not wholly lost, since it went to the strengthening of the foundations of the *science of music*.

A new era had arrived, Greece lost her position and became a dependency in the Macedonian empire. The centre of Greek life and thought had been transferred to Alexandria, and here at the great library

which had been founded B.C. 332 by Alexander the Great, Eratosthenes was librarian, and his name figures largely in the mathematics of Music. His lifetime extended from 276 to 196 B.C.

Two other Alexandrians complete the record so far as the present simple treatment of the development of the scale is concerned. They lived within the Christian era.

Didymus, A.D. 60, introduced the minor tone into the scale, and consequently the practical major third. He demonstrated the lesser or *minor tone* to be necessary to the right division of fourths and fifths.

Claudius Ptolemy, A.D. 130, accepted the scheme, but altered the arrangement of the tones.

Didymus and Claudius Ptolemy, the two latest philosophers who sought to perfect the diatonic scale, achieved highly important results by simple means; whereas the octochord as left by Pythagoras, comprised but two kinds of divisions, the tone and the hemitone (not exactly half a tone, it was the overplus after the measurement of the two whole tones in the tetrachord)—and these, taking C as the starting point for our convenience, may be represented thus:—

C	D	E	F	G	A	B	C
	major tone	major tone	hemi tone	major tone	major tone	major tone	hemi tone

this was constructed from a series of fifths.

Didymus shewed that the stricter mathematical division (not by fifths) required a lesser or minor tone in place of *one* major, and the amount of decrease went to increase the hemitone to a semitone, thus:—

C	D	E	F	G	A	B	C
	minor tone	major tone	semi tone	minor tone	major tone	major tone	semi tone

Claudius Ptolemy seventy years later altered this, transposing the minor tone to the second place,—

C	D	E	F	G	A	B	C
	major tone	minor tone	semi tone	major tone	minor tone	major tone	semi tone

as he left the *diatonic octave scale*, so it remains, practically the same in the teachings of the theorists since: some scholiasts have thought that preferably the minor tone should be placed between A and B, transferring the major tone between G and A.

This distinguished astronomer and mathematician Ptolemy, like Pythagoras, was the child of his time, given to much fanciful speculation and mysticism, finding music analogies in the virtues, and the sciences, in the parts of the human soul, and in the zodiac. He wrote largely, and completed the foundations upon which European music had been constructed, yet he had no conception of the structure that would be raised by coming generations. The Greeks had in their scale the elements of harmony yet they fell short of the realization, and it must ever be a wonder that, intellectual as they were, they missed it. Evolution was the destined way,—but it is so slow—so slow.

Except to the chosen few these questions of the scales fail to maintain their interest, however fascinating such studies of the calculation of theoretical niceties of numbers and ratios undoubtedly are to some minds, gifted with an aptitude for figures, yet with the general body of musicians a broad survey tells that old

formalisms in study are fast becoming obsolete. The advance of the System of Equal Temperament in these later years throughout the two worlds will render necessary a reconcilement between theory and practice, now widely at variance.

Historically the settlement of scale had its importance, although it came too late in time to be for the Greeks an effective force in their national music. The glory of Greece was fast departing, century after century in the course we have looked upon during our survey, empires had risen, empires had fallen, and in the disrupted state of social conditions, chaos often came, the Greek race itself was worn down and ultimately became absorbed amongst strangers, conquering races, and in the end we have to speak of her Art as Greco-Roman. Out of all these world changes we have isolated Music. To apprehend aright the slow march along the path of progress, we should now and then lift our thoughts to take account of the atmosphere and glance at the environment.

The final scale was the triumph of the mathematicians, they gained their ideal. Beyond this, however, nothing was accomplished,—nothing for actual Music. Harmony was not discovered, no great composer arose, certain lyrists and auloi-players we know of, whose deeds excited enthusiasm, but in what kind of display their art consisted no evidence exists, beyond the music to a few hymns, the melodic phrases of which do not commend themselves to us as examples of musical genius or talent. The irresistible charms exercised by the citharists upon the multitudes assembled to hear them, whether they sang by rule or improvised their melodies must be attributable in the

main to the character of the singer's voice, combined with the purport of the words sung. When with the modern knowledge of musical instruments we examine the nature of those which they had in their command, we have every reason to doubt the practical application of those fine distinctions of the pitches of the musical notes insisted upon by their learned theorists. The instruments simply could not give them, the exactness was beyond their staying and playing powers. The strings of a lyre had not the delicate permanence of pitch requisite for such claims, and certainly the flutes could not have rendered intervals so accurate. To set the intervals by bridges on the Kanon or monochords, by patient adjustment to marked divisions, was quite another matter, a mental recreation.

The trophy secured in the long march of music the thousand upon thousand years is the simple diatonic scale of five major tones and two semitones,—that is all. Up to the setting in of the Christian era that was the utmost attainment of the human race in the art of music, two formal tetrachords with a disjunct tone between; and if you will think of it this one fact has a mighty significance. What instinct of the race brought out this particular selection and arrangement, what indwelling demand of the ear impelled the choice, apparently from earliest impulses, we cannot tell,—there it is—the bed-rock upon which our system of harmony is founded; and the curiosity of the thing is that other races have for ages settled down upon a pentatonic system and still manifest an inborn aversion to harmony. We adjudge tones by means of calculated vibrations, ascertained by mechanism, the Greeks made their determinations by the measuring of

strings, the artist is always satisfied by the verdict of the ear.

To have established a tetrachord, and after centuries of intellectual strife to have secured a double tetrachord forming merely a simple scale of one octave, and that, the scale of *A minor*, may seem a small matter as a record of human history and of mental achievement. There is a saying of Aristotle which will justify a more inspiriting estimate,—the philosopher wrote,—

> "The true nature of a thing is whatsoever it becomes when the process of its development is complete."

To use a familiar illustration, expressing potentiality, —As the oak lies in the acorn, so all the after developments of our European music, their beauty, grandeur, massiveness, lie in that little scale of A minor; repeat it in transpositions of pitch from each note, repeat it in duplications above and below, and we know that we have therein the whole range of tones comprehensible by the human ear. Mr. W. Chappell, it is true, shews that the Greeks had no major scale, yet all conceivable scales are there, that one being the plasmic germ of all.

The process of the development of music from the reed pipe and from the string of a bow may seem insignificant as a subject of enquiry, but the philosopher will not think so. There is an apt parallel or analogy in "*wheat*"—"the staff of life," which I cannot omit reference to. Wheat was not found in the predynastic tombs of Egypt nor was it indigenous to that land, but was introduced into the Nile valley from the East. De Candole in his botanical researches, "The Origin of Cultivated Plants," has shewn that the indigenous home of wheat was in the western slopes of the Persian

mountains. Thence the cereal has spread in the course of ages over the whole earth. To this centre of human origin, to Iran and Media (now called Persia) the indications of my search all point for the source of music, here in this primal region the rude beginnings of the art of music were first heard, and the sounds thereof have gone out into all lands.

Greece, as was fitting, has occupied a large share of attention in these pages, her history seems a part of ours; her heroes are our heroes, her philosophers our philosophers, her poets our poets. The names of Homer and Pindar have come down the great highway of time, hailed and recognised as the names of chief Masters in Song, givers to whom the world is indebted; yet I think that to the man in the street who cares for music, there are two other names that would come to mind to stand first as the representatives of Greek song,—Sappho and Anacreon,—the man may not have known even the sound of the language in which they sung, yet English Song has made these names household words.

So when I see Sappho with her lyre pictured on the vases, and memory revives her story, or when, on an amphora, I see Anacreon depicted, trudging along, with his lyre slung on a stick across his shoulder, like a rustic traveller carrying his day's provender, and with his dog following,—they appeal to me as familiar friends. Then, too, I remember how a Greek poet apostrophised Anacreon,—

> O lover of the lovely lyre,
> Who as thy sweet will sped,
> Hast sailed through all the seas of life,
> With passion and with song.

Still we linger over the land of Greece, its haunting charm persists from youth to old age. Mr. F. G. Frazer, in his Pausanias, recalls the beautiful thought of Schiller, how, like that poet, the traveller,

> "Might have seen as in a vision
> The bright procession of the Gods
> Winding up the long slope of Olympus,
> Sometimes pausing to look back sadly
> At a world where they were no longer needed."

A glance at the map of Asia will show you a long trend of mountains from the Caspian Sea to the Persian Gulf. This vast plateau lies like a great backbone across Asia; the Caucasus, the Armenian mountains, the Zagros mountains, the Iranian mountains; on the eastern slope of these the Hindoo Cush, and the great Divide.

It is a curious fact worth thinking about that the Lute crossed over the ranges of the Hindoo Cush to the Valley of the Indus and to the Ganges and became the parent of the Ravanastron, or Indian Violin, and other tribes of bowed string instruments. The Lyre and the Harp never passed, nor the double flutes (except as left by Alexander the Great after his conquest) and the same with China. The feeling of the Hindoos has settled upon instruments with many frets and moveable bridges, and unfortunately the relics of the real old days of that land have not been preserved.

On the Western side of this mountainous range I have shewn the type of stringed instruments that prevailed, from Chaldea and Babylonia to Egypt, from Assyria and Asia Minor to Greece, the chief feature of the lyre and the harp being an *open frame* with a body that is

founded on a boat-shape. These open-frame instruments are not found on the Eastern side. Why? it remains an open question. Yet the long-necked Lute or Nefer became acclimatised there in India Was the instrument the cause of the character developed in their music? It is easy to see how it would lend itself to minute division, originating twenty intervals within an octave. Race, climate, and geography, are the great factors in the developments of the art of music.

Here, with reluctance I bring this volume to a close, for its pages have already extended in number much beyond the limit of the original intent. During the progress of the work new materials have come to hand giving an additional interest to the subject, information and illustrations acquired too late for incorporation in their relevant places, and too important in their bearing upon the investigation to be lightly sketched in, with but scant recognition of value. There is much yet to be added to the search for the origin of the Apollo Lyre; both the three-stringed and the four-stringed I have found depicted on a vase, of a date at least 900 B.C., and Dr. A. J. Evans has favoured me with a drawing of a pictograph seal, representing an eight-stringed lyre, found in his explorations at Knossos in Crete, and he writes me that he now places the date 2,000 B.C. From Egypt there comes a picture of large cross-string harps, a construction undreamt of as an ancient idea, but veritably so, discovered by Dr. Flinders Petrie at Abydos, in the Tombs of the Kings. The illustration which he has given me is of great interest.

Then the American explorers in Babylonia have

unearthed a tablet sculptured in relief showing musicians, and one sitting, playing a harp of eleven strings; Mr. St. Chad Boscawen gives the date of this slab *circa* B.C. 3,000, it was found at Tel-lo, the ancient Sirpurra. Another valuable find, much earlier in date, was a terra-cotta relief depicting a shepherd seated playing his lute, and his dog with a curly tail standing beside him (probably this lute-lover was an earlier Anacreon), the lute so like the Egyptian Nefer, and the attitude in holding the instrument exactly the same; for so remote a time the drawing of the figures is little less than marvellous. This relic was found in the schoolroom attached to the temple library at Nippur, it confirms the conjecture I put forth that the Nefer form was derived from Babylonia—I called it the paddle form.

Each year fresh treasures may be unearthed, so energetic are the new explorers, sons of nations, all rivals in archæological work, each emulating the other in adding new riches to the Museums to hold in trust for the world's coming ages, adding to the known past other more distant millenniums.

With so much material accumulating throwing new light upon the subject, I contemplate a sequel to this volume, to be ready, if health aids the fulfilment of my wish, by the coming Christmas, and to be entitled "Our Musical Inheritance."

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